

ACI Structural Journal VOLUME 90, 1993

Remove this section and include it with your January through December 1993 Volume 90 issues of the *ACI Structural Journal*.

Individually authored papers, committee reports, and abstracts of separate ACI publications are indexed in three categories:

1. Title..... **Fiber reinforced concrete beams under torsion** (90-S50) E. I. El-Niema Sept.-Oct. 1993489
2. Author..... **El-Niema, E. I.**—Fiber reinforced concrete beams under torsion (90-S50) Sept.-Oct. 1993489
3. Subject..... **Torsion**—Beams—Effect of steel fibers on behavior and ultimate strength (90-S50) Sept.-Oct. 1993489

Numbers in the parentheses with each entry constitute the title number of the paper or report. The first number is the

number of the volume in which the paper appeared; the second number is the number of the paper in the volume. For abstracts, which are not assigned a paper number, the identifying abbreviation AB is given; i.e., (90-AB). The month and year indicate the issue in which the material appeared. Page numbers indicate the first page of the item.

Discussion is identified as "Disc." and is indexed under the paper title and the name of each contributor to the discussion. Only discussion which appears in V. 90 is covered in this index. To find discussion of a paper, check the notice given in the issue in which the paper appeared. This notice will indicate where any discussion that developed is published. A similar notice is given with the abstracts of symposia publications. Discussion of symposia papers usually appears one year following publication of the abstract.

A

- Abdelghany, I. H.**—Flexural behavior of masonry walls strengthened with composite fabrics—Symposium abstract, SP 138-30 (90-AB) July-Aug. 1993462
- Abdel-Karim, Ahmad M.**—Computer analysis of spliced girder bridges (90-S3) Jan.-Feb. 199321
- Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods**—Symposium abstract, SP 138-19 (90-AB) Tomio Tamura, Hiroshi Mikami, Osamu Nakano, and Norimitsu Kishi July-Aug. 1993461
- Abstract of: Foundations for static equipment**, ACI 351.2R (90-S70) ACI Committee 351 Nov.-Dec. 1993692
- Adebar, Perry**—Bearing strength of compressive struts confined by plain concrete (90-S55) Sept.-Oct. 1993534
- Adhesives**—Anchors—Bond stress model for design (90-S53) Sept.-Oct. 1993514
- Adin, Moshe A.**—Cyclic behavior of epoxy-repaired reinforced concrete beam-column joints (90-S19) Mar.-Apr. 1993170
- Adluri, Seshu Madhava Rao**—Design of tie bars for large drilled pier foundations (90-S24) May-June 1993231
- Advanced composite demonstration bridge deck**—Symposium abstract, SP 138-49 (90-AB) Srinivasa L. Iyer July-Aug. 1993462
- Advances in underwater concreting: St. Lucie plant intake velocity cap rehabilitation**—Symposium abstract, SP 140-9 (90-AB) N. Hasan, E. Faerman, and D. Berner Nov.-Dec. 1993703
- Advantages of using lightweight concrete in a medium-rise building and adjoining post-tensioned parking garage**—Symposium abstract, SP 136-4 (90-AB) Russell Trumble and Luis Santizo Jan.-Feb. 1993128
- Aggregates**—Coarse—Ultimate strength of confined high-strength concrete (90-S63) Nov.-Dec. 1993632
- Ahmad, S.**—Chloride permeability and AC impedance of high-performance concrete—Symposium abstract, SP 140-6 (90-AB) Nov.-Dec. 1993703
- Air entrainment**—High-performance concrete for bridge construction—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993703
- Aitcin, P. C.**—Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993703
- Akanni, Adeniyi**—Tensile lap splices under static loading: A review of the proposed ACI 318 code provisions (90-S40) July-Aug. 1993374
- Alamri, A. M.**—Properties of pozzolanic mortars cured in hot dry environments—Symposium abstract, SP 139-5 (90-AB) Sept.-Oct. 1993584
- Alcocer, Sergio M.**—Strength of reinforced concrete frame connections rehabilitated by jacketing (90-S26) May-June 1993249
- Alexander, Scott D. B.**—Disc. closure Tests of column-flat plate connections (89-S46) Sept.-Oct. 1993574
- Ali, M. G.**—Effect of temperature on cathodic protection criterion for reinforced concrete structures—Symposium abstract, SP 139-2 (90-AB) Sept.-Oct. 1993584

- Alkhairi, F. M.**—Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation—Symposium abstract, SP 138-27 (90-AB) July-Aug. 1993462
- Al-Kurdi, S. M. A.**—Effect of hot weather conditions on the microcracking and corrosion cracking potential of reinforced concrete—Symposium abstract, SP 139-1 (90-AB) Sept.-Oct. 1993584
- Al-Mandil, M. Y.**
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 199337
—Closure (90-S5) Nov.-Dec. 1993700
- Al-Musawi, Janan M. S.**—Disc. closure Shear design of high- and normal strength concrete beams with web reinforcement (89-S62) Sept.-Oct. 1993578
- Alsayed, Saleh H.**—Flexural deflection of reinforced fibrous concrete beams (90-S9) Jan.-Feb. 199372
- Al-Shaikh, Abdulrahman**—Effect of reinforcement ratio on the effective moment of inertia of reinforced concrete beams (90-S15) Mar.-Apr. 1993144
- Al-Zaid, Rajeh Z.**—Effect of reinforcement ratio on the effective moment of inertia of reinforced concrete beams (90-S15) Mar.-Apr. 1993144
- Anchor bolts**—Design methods for static equipment foundations—Committee report abstract (90-S70) Nov.-Dec. 1993692
- Anchorage**
—Epoxy-coated hooked bars relative to uncoated bars (90-S23) Mar.-Apr. 1993210
—Epoxy-coated reinforcement—Design recommendations (90-S10) Jan.-Feb. 199377
—Equipment into supporting foundation—Committee report abstract (90-S70) Nov.-Dec. 1993692
- Anchorage strength of epoxy-coated hooked bars** (90-S23) Bilal S. Hamad, James O. Jirsa, and Natalie I. D'Abreu de Paulo Mar.-Apr. 1993210
- Anchors**
—Adhesive—Behavior and design procedure (90-S53) Sept.-Oct. 1993514
—Channel—Behavior and applications (90-S43) July-Aug. 1993407
—Epoxy sockets—Performance evaluation for nonmetallic prestressed tendon—Symposium abstract, SP-138 (90-AB) July-Aug. 1993461
- Anderson, D. L.**
—Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 1—Design concept, details, and model (90-S48) Sept.-Oct. 1993467
—Proof test of a retrofit concept for the San Francisco double-deck viaducts—Part 2: Test details and results (90-S62) Nov.-Dec. 1993616
- Application of super workable concrete to construction of a 20-story building**—Symposium abstract, SP 140-7 (90-AB) S. Kuroiwa, Y. Matsuka, M. Hayakawa, and T. Shindoh Nov.-Dec. 1993703

ACI Structural Journal VOLUME 90, 1993

Remove this section and include it with your January through December 1993 Volume 90 issues of the *ACI Structural Journal*.

Individually authored papers, committee reports, and abstracts of separate ACI publications are indexed in three categories:

1. Title **Fiber reinforced concrete beams under torsion** (90-S50) E. I. El-Niema Sept.-Oct. 1993489
2. Author **El-Niema, E. I.**—Fiber reinforced concrete beams under torsion (90-S50) Sept.-Oct. 1993489
3. Subject..... **Torsion**—Beams—Effect of steel fibers on behavior and ultimate strength (90-S50) Sept.-Oct. 1993489

Numbers in the parentheses with each entry constitute the title number of the paper or report. The first number is the

number of the volume in which the paper appeared; the second number is the number of the paper in the volume. For abstracts, which are not assigned a paper number, the identifying abbreviation AB is given; i.e., (90-AB). The month and year indicate the issue in which the material appeared. Page numbers indicate the first page of the item.

Discussion is identified as "Disc." and is indexed under the paper title and the name of each contributor to the discussion. Only discussion which appears in V. 90 is covered in this index. To find discussion of a paper, check the notice given in the issue in which the paper appeared. This notice will indicate where any discussion that developed is published. A similar notice is given with the abstracts of symposia publications. Discussion of symposia papers usually appears one year following publication of the abstract.

A

- Abdelghany, I. H.**—Flexural behavior of masonry walls strengthened with composite fabrics—Symposium abstract, SP 138-30 (90-AB) July-Aug. 1993462
- Abdel-Karim, Ahmad M.**—Computer analysis of spliced girder bridges (90-S3) Jan.-Feb. 199321
- Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods**—Symposium abstract, SP 138-19 (90-AB) Tomio Tamura, Hiroshi Mikami, Osamu Nakano, and Norimitsu Kishi July-Aug. 1993461
- Abstract of: Foundations for static equipment**, ACI 351.2R (90-S70) ACI Committee 351 Nov.-Dec. 1993692
- Adebar, Perry**—Bearing strength of compressive struts confined by plain concrete (90-S55) Sept.-Oct. 1993534
- Adhesives**—Anchors—Bond stress model for design (90-S53) Sept.-Oct. 1993514
- Adin, Moshe A.**—Cyclic behavior of epoxy-repaired reinforced concrete beam-column joints (90-S19) Mar.-Apr. 1993170
- Adluri, Seshu Madhava Rao**—Design of tie bars for large drilled pier foundations (90-S24) May-June 1993231
- Advanced composite demonstration bridge deck**—Symposium abstract, SP 138-49 (90-AB) Srinivasa L. Iyer July-Aug. 1993462
- Advances in underwater concreting: St. Lucie plant intake velocity cap rehabilitation**—Symposium abstract, SP 140-9 (90-AB) N. Hasan, E. Faerman, and D. Berner Nov.-Dec. 1993703
- Advantages of using lightweight concrete in a medium-rise building and adjoining post-tensioned parking garage**—Symposium abstract, SP 136-4 (90-AB) Russell Trumble and Luis Santizo Jan.-Feb. 1993128
- Aggregates**—Coarse—Ultimate strength of confined high-strength concrete (90-S63) Nov.-Dec. 1993632
- Ahmad, S.**—Chloride permeability and AC impedance of high-performance concrete—Symposium abstract, SP 140-6 (90-AB) Nov.-Dec. 1993703
- Air entrainment**—High-performance concrete for bridge construction—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993703
- Aitcin, P. C.**—Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993703
- Akanni, Adeniyi**—Tensile lap splices under static loading: A review of the proposed ACI 318 code provisions (90-S40) July-Aug. 1993374
- Alamri, A. M.**—Properties of pozzolanic mortars cured in hot dry environments—Symposium abstract, SP 139-5 (90-AB) Sept.-Oct. 1993584
- Alcocer, Sergio M.**—Strength of reinforced concrete frame connections rehabilitated by jacketing (90-S26) May-June 1993249
- Alexander, Scott D. B.**—Disc. closure Tests of column-flat plate connections (89-S46) Sept.-Oct. 1993574
- Ali, M. G.**—Effect of temperature on cathodic protection criterion for reinforced concrete structures—Symposium abstract, SP 139-2 (90-AB) Sept.-Oct. 1993584

- Alkhairi, F. M.**—Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation—Symposium abstract, SP 138-27 (90-AB) July-Aug. 1993462
- Al-Kurdi, S. M. A.**—Effect of hot weather conditions on the microcracking and corrosion cracking potential of reinforced concrete—Symposium abstract, SP 139-1 (90-AB) Sept.-Oct. 1993584
- Al-Mandil, M. Y.**
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 199337
—Closure (90-S5) Nov.-Dec. 1993700
- Al-Musawi, Janan M. S.**—Disc. closure Shear design of high- and normal strength concrete beams with web reinforcement (89-S62) Sept.-Oct. 1993578
- Alsayed, Saleh H.**—Flexural deflection of reinforced fibrous concrete beams (90-S9) Jan.-Feb. 199372
- Al-Shaikh, Abdulrahman**—Effect of reinforcement ratio on the effective moment of inertia of reinforced concrete beams (90-S15) Mar.-Apr. 1993144
- Al-Zaid, Rajeh Z.**—Effect of reinforcement ratio on the effective moment of inertia of reinforced concrete beams (90-S15) Mar.-Apr. 1993144
- Anchor bolts**—Design methods for static equipment foundations—Committee report abstract (90-S70) Nov.-Dec. 1993692
- Anchorage**
—Epoxy-coated hooked bars relative to uncoated bars (90-S23) Mar.-Apr. 1993210
—Epoxy-coated reinforcement—Design recommendations (90-S10) Jan.-Feb. 199377
—Equipment into supporting foundation—Committee report abstract (90-S70) Nov.-Dec. 1993692
- Anchorage strength of epoxy-coated hooked bars** (90-S23) Bilal S. Hamad, James O. Jirsa, and Natalie I. D'Abreu de Paulo Mar.-Apr. 1993210
- Anchors**
—Adhesive—Behavior and design procedure (90-S53) Sept.-Oct. 1993514
—Channel—Behavior and applications (90-S43) July-Aug. 1993407
—Epoxy sockets—Performance evaluation for nonmetallic prestressed tendon—Symposium abstract, SP-138 (90-AB) July-Aug. 1993461
- Anderson, D. L.**
—Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 1—Design concept, details, and model (90-S48) Sept.-Oct. 1993467
—Proof test of a retrofit concept for the San Francisco double-deck viaducts—Part 2: Test details and results (90-S62) Nov.-Dec. 1993616
- Application of super workable concrete to construction of a 20-story building**—Symposium abstract, SP 140-7 (90-AB) S. Kuroiwa, Y. Matsuka, M. Hayakawa, and T. Shindoh Nov.-Dec. 1993703

Application of super workable concrete to reinforced concrete structures with difficult construction conditions—Symposium abstract, SP 140-8 (90-AB) N. Miura, N. Takeda, R. Chikamatsu, and S. Sogo Nov.-Dec. 1993	703
Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) H. Nakagawa, M. Kobayashi, T. Suenaga, T. Ouchi, S. Watanabe, and K. Satoyama July-Aug. 1993	461
Aramid fabric as a reinforcement of concrete—Symposium abstract, SP 138-10 (90-AB) Janusz Kasperkiewicz and Hans W. Reinhardt July-Aug. 1993	461
Arima, L.—Development and utilization of high-performance concrete employed in the Akashi Kaiyō Bridge—Symposium abstract, SP 140-2 (90-AB) Nov.-Dec. 1993	703
Armaghani, J.—High-performance concrete in Florida bridges—Symposium abstract, SP 140-1 (90-AB) Nov.-Dec. 1993	703
Asai, Hiroshi—Characteristics of aramid FRP rods—Symposium abstract, SP 138-3 (90-AB) July-Aug. 1993	461
Ashour, Samir A.—Flexural behavior of high-strength fiber reinforced concrete beams (90-S29) May-June 1993	279
Attard, M. M.—Ultimate strength of confined very high-strength concretes (90-S63) Nov.-Dec. 1993	632
Augustin, V.—High-performance concretes in the "Elorn" Bridge—Symposium abstract, SP 140-4 (90-AB) Nov.-Dec. 1993	703
AWWA Committee 400—Testing reinforced concrete structures for watertightness, ACI 350.1R/AWWA 400 (90-S35) May-June 1993	324
Axial loads	
—Confined concrete columns with stubs—Elasto-plastic behavior (90-S44) July-Aug. 1993	414
—Pier hinges—One-way reinforced concrete—Failure modes (90-S59) Sept.-Oct. 1993	568
Azad, A. K.	
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 1993	37
—Closure (90-S5) Nov.-Dec. 1993	700
Aziznami, Atorod—Bond performance of reinforcing bars embedded in high-strength concrete (90-S57) Sept.-Oct. 1993	554

B

Bakht, Baidar—Disc. Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Nov.-Dec. 1993	700
Ballinger, Craig—Strengthening of reinforced concrete chimneys, columns, and beams with carbon fiber reinforced plastics—Symposium abstract, SP 138-15 (90-AB) July-Aug. 1993	461
Ballivy, G.—Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993	703
Baluch, M. H.	
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 1993	37
—Closure (90-S5) Nov.-Dec. 1993	700
Bank, Lawrence C.—Pultruded FRP grating reinforced concrete slabs—Symposium abstract, SP 138-34 (90-AB) July-Aug. 1993	462
Bansleben, D. A.—Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP 137-7 (90-AB) July-Aug. 1993	460
Bartholomew, Charles L.—FRP dowel bars in reinforced concrete pavements—Symposium abstract, SP 138-48 (90-AB) July-Aug. 1993	462
Basheer, P. A. M.—Influence of controlled permeability formwork liner on the quality of the cover concrete—Symposium abstract, SP 139-6 (90-AB) Sept.-Oct. 1993	584
Beam analysis using concrete tensile strength in truss models (89-S27)	
—Khaled A. Al-Nahlawi and James K. Wight V. 89 May-June 1992, p. 284	284
—Disc. by Andor Windisch Mar.-Apr. 1993	220
Beams	
—Composite—Mechanical properties of fiber reinforced plastic—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Deep—Shear behavior—Strut-and-tie model study (90-S38) July-Aug. 1993	356
—Deflections—Immediate and long-term changes—Experimental and calculated values (90-S39) July-Aug. 1993	364
—Design procedure based on compressive force path concept (90-S2) Jan.-Feb. 1993	12
—Ductility—Fiber reinforced plastic tendons and transverse reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Effective moment of inertia—Different reinforcement ratios (90-S15) Mar.-Apr. 1993	144
—Fiber reinforced plastic as external cable—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Fiberglass pretensioned—Durability studies (90-S54) Sept.-Oct. 1993	525
—Fibrous—Torsional resistance (90-S50) Sept.-Oct. 1993	489
—Flanged—Modes of failure and ultimate strength analysis (90-S61) Nov.-Dec. 1993	601
—High-strength fiber reinforced concrete—Flexural behavior (90-S29) May-June 1993	279

—Longitudinal reinforcement—Shear capacity prediction using fracture mechanics (90-S60) Nov.-Dec. 1993	591
—Prestressed with external tendons—Strut-and-tie model for strength prediction (90-S69) Nov.-Dec. 1993	683
—Progressive cracking and tension stiffening—Deformation computation (90-S49) Sept.-Oct. 1993	480
—Reinforced steel fiber concrete—Flexural deflection prediction (90-S9) Jan.-Feb. 1993	72
—Shear—Reinforced polymer concrete with recycled plastic—Failure modes (90-S68) Nov.-Dec. 1993	675
—Shear performance of joint regions with ductile circular columns (90-S62) Nov.-Dec. 1993	616
—Steel fiber reinforced concrete—Shear behavior (90-S1) Jan.-Feb. 1993	3
—Steel-reinforced polymer concrete—Design approach for shear (90-S58) Sept.-Oct. 1993	562
—Tensile lap splices—Bond performance (90-S40) July-Aug. 1993	374
—Time-dependent structural serviceability analysis (90-S22) Mar.-Apr. 1993	204
Bearing capacity—Compression struts of different geometry (90-S55) Sept.-Oct. 1993	534
Bearing strength of compressive struts confined by plain concrete (90-S55) Perry Adebar and Zongyu Zhou Sept.-Oct. 1993	534
Bearings—Precast floor and roof members—Design—Committee report (90-S13) Jan.-Feb. 1993	115
Beeby, A. W.—Disc. Shrinkage cracking in fully restrained concrete members (89-S15) Jan.-Feb. 1993	123
Behavior of channel anchors in thin slabs under combined shear and tension (pullout) loads (90-S43) Francis A. Olukun and Edwin G. Burdette July-Aug. 1993	407
Behavior of columns continuous through concrete floors (89-S40)	
—Chuan-Chien Shu and Neil M. Hawkins V. 89 July-Aug. 1992, p. 405	405
—Disc. by William L. Gamble and M. K. Kayani May-June 1993	329
Behavior of externally confined concrete columns—Symposium abstract, SP 138-16 (90-AB) Hamid Saadatmanesh, Mohammad R. Ehsani, and Mu-Wen Li July-Aug. 1993	461
Behavior of jacketed columns (90-S30) Ugur Ensoy, A. Tugrul Tankut, and Ramadan Suleiman May-June 1993	288
Behavior of prestressed concrete beams using FRP as external cable—Symposium abstract, SP 138-25 (90-AB) H. Mutsaers and A. Machida July-Aug. 1993	461
Ben-Bassat, M.—Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Bending	
—Biaxial—Analysis of reinforced concrete sections (90-S18) Mar.-Apr. 1993	163
—Fiber reinforced plastic rods—Tensile strength—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Jacketed column behavior (90-S30) May-June 1993	288
—Joint mechanics—Parametric investigation (90-S8) Jan.-Feb. 1993	61
Bending moments	
—Beams with fiber reinforced plastic reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Columns—Design procedure for oddly shaped sections (90-S28) May-June 1993	269
—Tie bar design for large-diameter piers (90-S24) May-June 1993	231
Bentur, A.—Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Bergin, M.—High-performance concrete in Florida bridges—Symposium abstract, SP 140-1 (90-AB) Nov.-Dec. 1993	703
Berner, Dale E.	
—Advances in underwater concreting: St. Lucie plant intake velocity cap rehabilitation—Symposium abstract, SP 140-9 (90-AB) Nov.-Dec. 1993	703
—High-ductility, high-strength lightweight aggregate concrete—Symposium abstract, SP 136-8 (90-AB) Jan.-Feb. 1993	128
Bhutta, M. A. R.—Underwater adhesion of polymethyl methacrylate mortars—Symposium abstract, SP 137-6 (90-AB) July-Aug. 1993	460
Biaxial bending design of arbitrarily shaped reinforced concrete column (90-S28) C. Y. Yau, S. L. Chan, and A. K. W. So May-June 1993	269
Bjerkell, Lars—Strain development and static compressive strength of concrete exposed to water pressure loading (90-S33) May-June 1993	310
Bobrowski, Jan	
—Design model for structural concrete base on the concept of the compressive force path (90-S2) Jan.-Feb. 1993	12
—Closure (90-S2) Nov.-Dec. 1993	699
Bonacci, John—Parametric investigation of joint mechanics (90-S8) Jan.-Feb. 1993	61
Bond	
—Concrete to reinforcement—Effect of deformation height and spacing (90-S65) Nov.-Dec. 1993	646
—Concrete to reinforcement—Epoxy-coated reinforcement under repeated loading (90-S47) July-Aug. 1993	451
—Concrete to reinforcement—Strength changes caused by epoxy coatings (90-S11) Jan.-Feb. 1993	89
Bond characteristics of FRP rod and concrete after freezing and thawing deterioration—Symposium abstract, SP 138-4 (90-AB) Mitsuyasu Mashima and Kaoru Iwamoto July-Aug. 1993	461

Bond of epoxy-coated reinforcement: Splices (90-S11) Cynthia J. Hester, Shahin Salamizavareh, David Darwin, and Steven L. McCabe Jan.-Feb. 1993	89
Bond of GFRP rebars to ordinary-strength concrete —Symposium abstract, SP 138-21 (90-AB) M. R. Ehsani, H. Saadatmanesh, and S. Tao July-Aug. 1993	461
Bond performance of concrete members reinforced with FRP bars —Symposium abstract, SP 138-46 (90-AB) Toshiyuki Kanakubo, Keisuke Yonemaru, Hiroshi Fukuyama, Masami Fujisawa, and Yasuhisa Sonobe July-Aug. 1993	462
Bond performance of reinforcing bars embedded in high-strength concrete (90-S57) Atorod Azizinamini, Mark Stark, John J. Roller, and S. K. Ghosh Sept.-Oct. 1993	554
Bond strength	
—Beams reinforced with fiber reinforced plastic bars—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Epoxy-coated hooked bars (90-S23) Mar.-Apr. 1993	210
—Epoxy-coated reinforcement under repeated loads (90-S47) July-Aug. 1993	451
—Epoxy-coated reinforcing bar splices confined with transverse reinforcement (90-S10) Jan.-Feb. 1993	77
—Fiber reinforced plastic rods and concrete—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Reinforcing bars and concrete—Effect of deformation pattern (90-S65) Nov.-Dec. 1993	646
—Reinforcing bars embedded in normal and high-strength concrete (90-S57) Sept.-Oct. 1993	554
—Tensile lap splices under static load—Design provisions (90-S40) July-Aug. 1993	374
Bond stress	
—Beams with fiber reinforced plastic reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Epoxy-coated bar splices (90-S10) Jan.-Feb. 1993	77
—Retrofit adhesive anchors—Rational design model (90-S53) Sept.-Oct. 1993	514
—Shear capacity of beams—Predicted and measured results (90-S60) Nov.-Dec. 1993	591
Bond stress model for design of adhesive anchors (90-S53) R. A. Cook, G. T. Doerr, and R. E. Klingner Sept.-Oct. 1993	514
Bortolotti, Lionello —Disc. Shear behavior of high-strength fiber reinforced concrete beams (89-S19) Jan.-Feb. 1993	126
Bradford, Nick M. —Lateral confinement of concrete using FRP reinforcement—Symposium abstract, SP 138-13 (90-AB) July-Aug. 1993	461
Branson, Dan E. —Initial and time-dependent deformation of progressively cracking nonprestressed and partially prestressed concrete beams (90-S49) Sept.-Oct. 1993	480
Bremner, T. W.	
—Fatigue strength and endurance limit of lightweight concrete—Symposium abstract, SP 136-12 (90-AB) Jan.-Feb. 1993	129
—Influence of compressive stress on the permeability of concrete—Symposium abstract, SP 136-9 (90-AB) Jan.-Feb. 1993	128
Bridge decks	
—New prestressing composite materials for cables—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Polymer wearing surface repair—Field performance studies—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
—Punching capacity loss from crack damage (90-S5) Jan.-Feb. 1993	37
Bridges	
—Design deficiencies in double-deck viaducts in San Francisco (90-S48) Sept.-Oct. 1993	467
—Fiber reinforced plastic as reinforcement—Evaluation—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Girder-slab—Punching capacity loss from crack damage (90-S5) Jan.-Feb. 1993	37
—High-performance concrete development and use in Japan—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—High-performance concrete mixtures—Florida research—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Hinged columns—Seismic behavior (90-S59) Sept.-Oct. 1993	568
—Lightweight concrete used in California highway system—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Spliced girders—Computer analysis (90-S3) Jan.-Feb. 1993	21
Brondum-Nielsen, Troels —Creep compensating prestress of tanks (90-S4) Jan.-Feb. 1993	32
Brown, Vicki L. —FRP dowel bars in reinforced concrete pavements—Symposium abstract, SP 138-48 (90-AB) July-Aug. 1993	462
Buckling —Wall stability in reinforced concrete and masonry buildings (90-S41) July-Aug. 1993	385
Budelmann, H.	
—Creep rupture behavior of FRP elements for prestressed concrete—Phenomenon, results, and forecast models—Symposium abstract, SP 138-6 (90-AB) July-Aug. 1993	461
—Principles of design of FRP tendons and anchorages for post-tensioned concrete—Symposium abstract, SP 138-38 (90-AB) July-Aug. 1993	462
Building codes—ACI	
—Column slenderness provisions—Proposed changes (90-S32) May-June 1993	302

—Deflection prediction equations for reinforced concrete members (90-S39) July-Aug. 1993	364
—Framed column effective length factor (90-S14) Mar.-Apr. 1993	135
—Lap splice length provision for bars in tension (90-S42) July-Aug. 1993	393
—Load capacities for ice-resisting walls (90-S6) Jan.-Feb. 1993	42
—Precast concrete design variances—Committee report (90-S13) Jan.-Feb. 1993	115
—Reliability associated with safety factors (90-S27) May-June 1993	262
—Tensile lap splices under static loads—Review of design provisions (90-S40) July-Aug. 1993	374
Building codes—General	
—Foundations for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
—Reinforced concrete design regulations—Reliability associated with safety factors (90-S27) May-June 1993	262
Burdette, Edwin G. —Behavior of channel anchors in thin slabs under combined shear and tension (pullout) loads (90-S43) July-Aug. 1993	407
Burgoyne, C. J. —Should FRP be bonded to concrete?—Symposium abstract, SP 138-23 (90-AB) July-Aug. 1993	461
Burns, Ned H. —Very early post-tensioning of prestressed concrete pavements (90-S66) Nov.-Dec. 1993	658

C

Cabrera, J. G.	
—Effect of curing temperature on the chloride ion diffusion of superplasticized cement and fly ash cement pastes—Symposium abstract, SP 139-4 (90-AB) Sept.-Oct. 1993	584
—Properties of pozzolanic mortars cured in hot dry environments—Symposium abstract, SP 139-5 (90-AB) Sept.-Oct. 1993	584
Carbon	
—Fiber net reinforcement—Crack control studies—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Fiber reinforced plastic—Strengthening applications—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Carier, P. D. —Thin polymer wearing surfaces for preventive maintenance of bridge decks—Symposium abstract, SP 137-3 (90-AB) July-Aug. 1993	460
Cathodic protection —Temperature effect—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Causes, evaluation, and repair of cracks in concrete structures , ACI 224.1R-90—Proposed revision (90-CA) May-June 1993	331
Cement pastes —Superplasticized—Chloride ion diffusion—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Chajes, Michael J. —Prestressed concrete beams using nonmetallic tendons and external shear reinforcement—Symposium abstract, SP 138-29 (90-AB) July-Aug. 1993	462
Chan, S. L. —Biaxial bending design of arbitrarily shaped reinforced concrete column (90-S28) May-June 1993	269
Changes to and applications of development and lap splice length provisions for bars in tension (ACI 318-89) (90-S42) LeRoy A. Lutz, S. Ali Mirza, and Narendra K. Gosain July-Aug. 1993	393
Characteristics of aramid FRP rods —Symposium abstract, SP 138-3 (90-AB) Kunihiro Mukae, Shin'ichi Kumagai, Hiroshi Nakai, and Hiroshi Asai July-Aug. 1993	461
Chemical attack —Salt saturated mass concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Chen, Wai-Fah	
—Construction safety of multistory concrete buildings (90-S36) July-Aug. 1993	335
—K-factor equation to alignment charts for column design (90-S25) May-June 1993	242
—On effective length factor of framed columns in the ACI Building Code (90-S14) Mar.-Apr. 1993	135
Chen, Zhiwei —Finite element analysis of high-strength concrete slabs (90-S52) Sept.-Oct. 1993	505
Chiam, Andy T. P. —Influence of steel fibers on the shear resistance of lightweight concrete I-beams (90-S12) Jan.-Feb. 1993	103
Chikamatsu, R. —Application of super workable concrete to reinforced concrete structures with difficult construction conditions—Symposium abstract, SP 140-8 (90-AB) Nov.-Dec. 1993	703
Chloride permeability and AC impedance of high-performance concrete —Symposium abstract, SP 140-6 (90-AB) M. R. Hansen, M. L. Leming, P. Zia, and S. Ahmad Nov.-Dec. 1993	703
Chlorides —High-performance concrete permeability measurement methods—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Clark, B. A. —Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Cleary, D. B. —Epoxy-coated reinforcement under repeated loading (90-S47) July-Aug. 1993	451
Close, Steven R. —Disc. Serviceability of circular prestressed concrete tanks (89-S34) May-June 1993	221
Coatings	
—Epoxy—Bond strength of reinforcing materials (90-S10) Jan.-Feb. 1993	77
—Epoxy—Hooked bar anchorage strength (90-S23) Mar.-Apr. 1993	210

Columns

- Arbitrarily shaped sections—Biaxial bending design procedure (90-S28) May-June 1993 269
- Blockwork masonry strength and behavior (90-S51) Sept.-Oct. 1993 496
- Circular—Shear design procedure (90-S20) Mar.-Apr. 1993 180
- Confining steel design and detailing (90-S44) July-Aug. 1993 414
- Fiber composite wraps—Externally confined concrete behavior—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461
- Framed—K-factor equation for design (90-S25) May-June 1993 242
- Framed—Modified design procedure (90-S14) Mar.-Apr. 1993 135
- Hinged—Monotonic and cyclic behavior (90-S59) Sept.-Oct. 1993 568
- Interlocking spiral reinforcement—Seismic design and behavior (90-S21) Mar.-Apr. 1993 192
- Jacketed joints—Shear strength performance (90-S26) May-June 1993 249
- Pile cap shear strength—Strut-and-tie model (90-S38) July-Aug. 1993 356
- Reinforced concrete with rectangular cross sections—Fire resistance tests (90-S7) Jan.-Feb. 1993 52
- Retrofit concept proof test—Setup and loading scheme (90-S62) Nov.-Dec. 1993 616
- Retrofit designs for double-deck viaducts in San Francisco (90-S48) Sept.-Oct. 1993 467
- Seismic retrofit of lap splices (90-S45) July-Aug. 1993 432
- Slender—ACI Building Code design provisions—Proposed changes (90-S32) May-June 1993 302
- Spiral reinforcement—Confined concrete behavior (90-S56) Sept.-Oct. 1993 542
- Strengthening jackets—Behavior under combined axial load and bending (90-S30) May-June 1993 288

Committee

- 201—Durable concrete in hot climates—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993 584
- 207 Report—Cooling and insulating systems for mass concrete, ACI 207.4R-93—Proposed revision (90-CA) May-June 1993 331
- 210 Report—Erosion of concrete in hydraulic structures, ACI 210R-87—Proposed revision (90-CA) May-June 1993 331
- 213—Structural lightweight aggregate concrete performance—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993 128
- 224 Report—Causes, evaluation, and repair of cracks in concrete structures, ACI 224.1R-90—Proposed revision (90-CA) May-June 1993 331
- 336 Report—Design and construction of drilled piers, ACI 336.3R—Proposed revision (90-CA) Jan.-Feb. 1993 128
- 347 Report—Guide to formwork for concrete, ACI 347R-88 Revision (90-CA) Nov.-Dec. 1993 703
- 350 Report—Testing reinforced concrete structures for watertightness, ACI 350.1R/AWWA 400 (90-S35) May-June 1993 324
- 351 Report—Abstract of: Foundations for static equipment, ACI 351.2R (90-S70) Nov.-Dec. 1993 692
- 359 Report—Proposed revisions to: Code for concrete reactor vessels and containments (ACI 359-92)—Proposed revision (90-ST) July-Aug. 1993 459
- 423—Fiber-reinforced-plastic reinforcement for concrete structures—International symposium—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461
- 440—Fiber-reinforced-plastic reinforcement for concrete structures—International symposium—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461
- 503 Report—Use of epoxy compounds with concrete, ACI 503R—Revision (90-CA) Sept.-Oct. 1993 584
- 523 Report—Guide for cellular concrete above 50 pcf with compressive strength less than 2500 psi, ACI 523.3R-75 (Revised 1982) (Reapproved 1987)—Revision (90-CA) July-Aug. 1993 460
- 548—Report—Guide for mixing and placing sulfur concrete in construction, ACI 548.2R-88—Revision (90-CA) July-Aug. 1993 460
- Polymer concrete—Symposium abstract, SP-137 (90-AB) July-Aug. 1993 460
- Report—Standard specification for latex-modified concrete (LMC) overlays (ACI 548.4-93) (90-ST) Nov.-Dec. 1993 703
- 549—Report—Guide for the design, construction, and repair of ferrocement, ACI 549.1R-88—Revision (90-CA) ACI Committee 549 July-Aug. 1993 460
- Report—State-of-the-art report on ferrocement, ACI 549R-88—Revision (90-CA) July-Aug. 1993 460
- 550 Report—Design recommendations for precast concrete structures, ACI 550R (90-S13) Jan.-Feb. 1993 115

Composite construction

- Beams reinforced with fiber reinforced plastic—Mechanical properties—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461
- Connections between precast members (90-S34) May-June 1993 316
- Precast concrete pipe lined with polymer mortar—Symposium abstract, SP-137 (90-AB) July-Aug. 1993 460

Composite materials

- Carbon fiber reinforced plastic—Structural strengthening applications—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461

- Graphite and fiberglass cables for prestressing bridge decks—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461
- Seismic retrofitting of unreinforced masonry structures—Symposium abstract, SP-138 (90-AB) July-Aug. 1993 461

Compressive strength

- Columns with unreinforced and laterally reinforced, full- and half-block masonry units (90-S51) Sept.-Oct. 1993 496
- Confined concrete—Triaxial tests (90-S63) Nov.-Dec. 1993 632
- Pore pressure in concrete cylinders (90-S33) May-June 1993 310
- Super-workable concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993 703
- Warm, humid curing conditions—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993 584

Computer analysis of reinforced concrete sections under biaxial bending and longitudinal load (90-S18) M. L. Zak Mar.-Apr. 1993 163

Computer analysis of spliced girder bridges (90-S3) Ahmad M. Abdel-Karim and Maher K. Tadros Jan.-Feb. 1993 21

Computer programs

- Biaxial bending design of columns (90-S28) May-June 1993 269
- Column effective length factors in building frames (90-S25) May-June 1993 242
- Composite precast concrete girder bridge analysis (90-S3) Jan.-Feb. 1993 21
- Strength analysis of reinforced concrete sections (90-S18) Mar.-Apr. 1993 163

Concrete blocks—Columns—Tie influence on ultimate load capacity (90-S51) Sept.-Oct. 1993 496

Concrete construction

- Hot climate problems—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993 584
- Precast concrete design recommendations—Committee report (90-S13) Jan.-Feb. 1993 115
- Safety of fast-rate constructed multistory buildings (90-S36) July-Aug. 1993 335
- Time-dependent structural serviceability problems (90-S22) Mar.-Apr. 1993 204

Concrete problems associated with hot climates—Symposium abstract, SP-139-8 (90-AB) J. M. Scanlon Sept.-Oct. 1993 584

Concretes

- Epoxy modification—Properties and polymerization process—Symposium abstract, SP-137 (90-AB) July-Aug. 1993 460
- Sulfur—New applications—Symposium abstract, SP-137 (90-AB) July-Aug. 1993 460
- Super-workable—Applications to reinforced concrete structures—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993 703

Concreting of thick sections in the tropics—Symposium abstract, SP-139-9 (90-AB) C. T. Tam, S. Swaddiwudhipong, A. C. Mani, and S. L. Lee Sept.-Oct. 1993 584

Confined concrete

- Circular spirals and hoops—Strength and ductility (90-S56) Sept.-Oct. 1993 542
- Column behavior under axial load and cyclic shear and flexure (90-S44) July-Aug. 1993 414
- Columns with interlocking spirals—Load tests (90-S21) Mar.-Apr. 1993 192
- Ultimate strength under triaxial loads—Aggregate size effect (90-S63) Nov.-Dec. 1993 632

Confined concrete columns with stubs (90-S44) Shamim A. Sheikh and Shafik S. Khoury July-Aug. 1993 414

Connections

- Adhesive anchors—Design recommendations (90-S53) Sept.-Oct. 1993 514
- Joint resistance in reinforced concrete frame structures (90-S8) Jan.-Feb. 1993 61
- Precast beam-column subassemblages—Design of fiber composites (90-S34) May-June 1993 316
- Precast concrete members—Design and detailing—Committee report (90-S13) Jan.-Feb. 1993 115
- Slab-column—Fiber reinforcement in lightweight concrete (90-S37) July-Aug. 1993 342

Construction safety of multistory concrete buildings (90-S36) Ashraf M. El-Shahhat, David V. Rosowsky, and Wai-Fah Chen July-Aug. 1993 335

Continuous beams—Moment redistribution reexamination (90-S16) Mar.-Apr. 1993 150

Contribution of steel fibers to the strength characteristics of lightweight concrete slab-column connections failing in punching shear (90-S37) D. D. Theodorakopoulos and R. Narayan Swamy July-Aug. 1993 342

Contribution to redistribution of moments in continuous reinforced concrete beams (90-S16) H. Scholz Mar.-Apr. 1993 150

Control of cracking by use of carbon fiber net as reinforcement for concrete—Symposium abstract, SP-138-18 (90-AB) Tatsunori Makizumi, Yoshifumi Sakamoto, and Shin'ichiro Okada July-Aug. 1993 461

Control of flexural crack width in cracked prestressed concrete members (89-S13)

- S. V. Krishna Mohan Rao and Walter H. Dilger V. 89 Mar.-Apr. 1992, p. 127
- Disc. by Edward G. Nawy Jan.-Feb. 1993 122
- Errata Jan.-Feb. 1993 122
- Cook, R. A.—Bond stress model for design of adhesive anchors (90-S33)

Sept.-Oct. 1993	514
Cooling and insulating systems for mass concrete, ACI 207.4R-93—Proposed revision (90-CA) ACI Committee 207 May-June 1993	331
Corrosion—Protection—High-performance concrete in Florida bridge construction—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Costaz, J. L.—HPC for the improvement of tightness of nuclear reactor containments in case of severe accidents—Symposium abstract, SP 140-11 (90-AB) Nov.-Dec. 1993	703
Coulombe, L. G.—Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993	703
Cover	
—Controlled permeability formwork liner—Influence on surface properties—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Dowel bar action analysis (90-S46) July-Aug. 1993	441
—Reinforcement development and splice length—Design recommendations (90-S42) July-Aug. 1993	393
Cover and stirrup effects on the shear response of dowel bar embedded in concrete (90-S46) Sandro Dei Poli, Marco di Prisco, and Pietro G. Garbarova July-Aug. 1993	441
Cracking	
—Control—Carbon fiber net as reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Deck slab in girder type bridges—Punching capacity (90-S5) Jan.-Feb. 1993	37
—Early strength of prestressed concrete for pavements (90-S66) Nov.-Dec. 1993	658
—Ferrocement slabs under punching shear load tests (90-S31) May-June 1993	294
—Flexural members—Deformation computation procedure (90-S49) Sept.-Oct. 1993	480
—Shear—Fiber concrete slabs (90-S37) July-Aug. 1993	342
Cracks	
—Water containment concrete structures—Design procedures—Committee report (90-S35) May-June 1993	324
—Width—Fiber reinforced plastic reinforced concrete members—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Creep	
—Fiber reinforced plastic reinforcement rupture performance—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Time-dependent serviceability analysis of concrete structures (90-S22) Mar.-Apr. 1993	204
Creep compensating prestress of tanks (90-S4) Troels Brøndum-Nielsen Jan.-Feb. 1993	32
Creep rupture behavior of FRP elements for prestressed concrete—Phenomenon, results, and forecast models—Symposium abstract, SP 138-6 (90-AB) H. Budelmann and F. S. Rostásy July-Aug. 1993	461
Critical assessment of ACI 318 Eq. (18-3) for prestressing steel stress at ultimate flexure (89-S50)	
—Ravi K. Devalapura and Maher K. Tadros V. 89 Sept.-Oct. 1992, p. 538	
—Disc. by William F. Lilly and authors Sept.-Oct. 1993	577
Curing	
—Conditions—Compressive strength of concrete—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Elevated temperatures—Electron-optical evaluation—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—High-performance concrete—Thermal effects—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Pozzolanic mortars in hot dry environment—Performance properties—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Cyclic behavior of epoxy-repaired reinforced concrete beam-column joints (90-S19) Moshe A. Adin, David Z. Yankelevsky, and Daniel N. Farhey Mar.-Apr. 1993	170
Cyclic loads	
—Beams with coated and uncoated reinforcement—Bond mechanism (90-S47) July-Aug. 1993	451
—Columns laterally reinforced by interlocking spirals (90-S21) Mar.-Apr. 1993	192
—Connections for precast beam-column subassemblages (90-S34) May-June 1993	316
—Jacketed column behavior (90-S30) May-June 1993	288
—Reinforced concrete wall panels—Control and interpretation of tests (90-S64) Nov.-Dec. 1993	642
Cyclic response of fibrous cast-in-place connections in precast beam-column subassemblages (90-S34) Khaled S. Soubra, James K. Wight, and Antoine E. Naaman May-June 1993	316
Cylinders, Test—Pore pressure development (90-S33) May-June 1993	310

D

D'Abreu de Paulo, Natalie L.—Anchorage strength of epoxy-coated hooked bars (90-S23) Mar.-Apr. 1993	210
Daly, J. M.—Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP 137-7 (90-AB) July-Aug. 1993	460
Damage—Bridge deck cracks—Punching failures of slabs (90-S5) Jan.-Feb. 1993	37

Dams—Mass concrete gravity section addition—Low-heat mixture proportioning study—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Darvall, P. LeP.—Ultimate strength of confined very high-strength concretes (90-S63) Nov.-Dec. 1993	632
Darwin, David	
—Bond of epoxy-coated reinforcement: Splices (90-S11) Jan.-Feb. 1993	89
—Effect of deformation height and spacing on bond strength of reinforcing bars (90-S65) Nov.-Dec. 1993	646
—Disc. closure Development length criteria: Bars not confined by transverse reinforcement (89-S68) Sept.-Oct. 1993	581
Davalath, Gupta S. R.—Design of tie bars for large drilled pier foundations (90-S24) May-June 1993	231
DeAscanis, Michael—Prestressed concrete beams using nonmetallic tendons and external shear reinforcement—Symposium abstract, SP 138-29 (90-AB) July-Aug. 1993	462
Deflection	
—Beams—Steel fibrous high-strength concrete (90-S29) May-June 1993	279
—Beams using fiber reinforced concrete rods as prestressing tendons—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Prediction—Comparison between ACI and CEB-FIP approaches for reinforced concrete members (90-S39) July-Aug. 1993	364
—Reinforced fibrous concrete beams—Experimental model study (90-S9) Jan.-Feb. 1993	72
—Spliced girder bridges—Computer analysis (90-S3) Jan.-Feb. 1993	21
—Time-dependent structural serviceability analysis of concrete structures (90-S22) Mar.-Apr. 1993	204
Deflection of reinforced concrete members: A critical review (90-S39) Amin Ghali July-Aug. 1993	364
Deformation	
—Jacketed columns—Axial load and bending tests (90-S30) May-June 1993	288
—Lightweight concrete I-beams with fiber reinforcement (90-S12) Jan.-Feb. 1993	103
—Pattern—Reinforcing bar bond strength (90-S65) Nov.-Dec. 1993	646
—Reinforced concrete structural walls—Testing errors (90-S64) Nov.-Dec. 1993	642
de Larrard, F.—High-performance concretes in the "Elorn" Bridge—Symposium abstract, SP 140-4 (90-AB) Nov.-Dec. 1993	703
Demura, K.—Underwater adhesion of polymethyl methacrylate mortars—Symposium abstract, SP 137-6 (90-AB) July-Aug. 1993	460
Design and construction of drilled piers, ACI 336.3R—Proposed revision (90-CA) ACI Committee 336 Jan.-Feb. 1993	128
Design concept for concrete members using continuous fiber reinforced materials—Symposium abstract, SP 138-33 (90-AB) H. Okamura, Y. Kakuta, T. Uomoto, and H. Mutsuyoshi July-Aug. 1993	462
Design model for structural concrete based on the concept of the compressive force path (90-S2)	
—Michael D. Kotsovos and Jan Bobrowski Jan.-Feb. 1993	12
—Errata Mar.-Apr. 1993	134
—Disc. by Viktor Sigrist and Peter Marti, and authors Nov.-Dec. 1993	699
Design of slender concrete columns—Revisited (90-S32) J. G. MacGregor May-June 1993	302
Design of tie bars for large drilled pier foundations (90-S24) Gupta S. R. Davalath, Seshu Madhava Rao Adluri, and Murty K. S. Madugula May-June 1993	231
Design recommendations for precast concrete structures, ACI 550R (90-S13) ACI-ASCE Committee 550 Jan.-Feb. 1993	115
Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP 137-7 (90-AB) J. M. Daly, J. A. Feldman, A. M. Rosenberg, D. A. Bansleben, and E. Zavadsky July-Aug. 1993	460
de Sitter, W. Reinold—Splitting forces in FRPR pretensioned concrete—Symposium abstract, SP 138-1 (90-AB) July-Aug. 1993	461
Detwiler, G.—High-performance concrete to plug the flooding of the Chicago tunnels—Symposium abstract, SP 140-10 (90-AB) Nov.-Dec. 1993	703
Devalapura, Ravi K.—Disc. closure Critical assessment of ACI 318 Eq. (18-3) for prestressing steel stress at ultimate flexure (89-S50) Sept.-Oct. 1993	577
Development and utilization of high-performance concrete employed in the Akashi Kaikyo Bridge—Symposium abstract, SP 140-2 (90-AB) K. Tanaka, K. Sato, S. Watanabe, I. Arima, and K. Suenaga Nov.-Dec. 1993	703
Development length—Reinforcement embedded in high-strength concrete—Bond performance (90-S57) Sept.-Oct. 1993	554
Development length criteria: Bars not confined by transverse reinforcement (89-S68)	
—David Darwin, Steven L. McCabe, Emmanuel K. Idun, and Steven P. Schoenekase V. 89 Nov.-Dec. 1992, p. 709	
—Disc. by Douglas Dongwoo Lee and authors Sept.-Oct. 1993	581
—Errata Sept.-Oct. 1993	583
Development of very low heat mass concrete mixtures for the modification of Theodore Roosevelt Dam—Symposium abstract, SP 140-13 (90-AB) W. F. Kepler and K. F. von Fay Nov.-Dec. 1993	704
Diagonal tension	
—Deep beams and pile caps—Strut-and-tie-model for shear behavior (90-	

S38) July-Aug. 1993	356
—Slender reinforced concrete flanged beams—Failure modes (90-S61) Nov.-Dec. 1993	601
Diaphragm—Flexibility—Precast concrete structures—Committee report (90-S13) Jan.-Feb. 1993	115
di Prisco, Marco—Cover and stirrup effects on the shear response of dowel bar embedded in concrete (90-S46) July-Aug. 1993	441
Dodd, T. A. H.—Effect of curing temperature on the chloride ion diffusion of superplasticized cement and fly ash cement pastes—Symposium abstract, SP 139-4 (90-AB) Sept.-Oct. 1993	584
Doerr, G. T.—Bond stress model for design of adhesive anchors (90-S53) Sept.-Oct. 1993	514
Dolan, Charles W.	
—Epoxy-socketed anchors for nonmetallic prestressing tendons—Symposium abstract, SP 138-24 (90-AB) July-Aug. 1993	461
—Prestressed concrete beams using nonmetallic tendons and external shear reinforcement—Symposium abstract, SP 138-29 (90-AB) July-Aug. 1993	462
Dowels	
—Cover and stirrup effects on shear response (90-S46) July-Aug. 1993	441
—Fiberglass reinforced plastic bars—Pavement applications—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Draper, E. A.—Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Drift response of medium-rise reinforced concrete buildings during earthquakes (89-S37)	
—Juan Barriola V. 89 July-Aug. 1992, p. 384	
—Disc. by Himat Solanki May-June 1993	329
Drilling—Pier foundations—Tie bar design (90-S24) May-June 1993	231
Driving stresses in fiberglass pretensioned piles (90-S67) Rajan Sen, Mohsen Issa, Patricia Wadsack, and Mohsen Shahawy Nov.-Dec. 1993	666
Duan, Lian	
—K-factor equation to alignment charts for column design (90-S25) May-June 1993	242
—On effective length factor of framed columns in the ACI Building Code (90-S14) Mar.-Apr. 1993	135
Ductile behavior of beams using FRP as tendons and transverse reinforcement—Symposium abstract, SP 138-39 (90-AB) H. Taniguchi, H. Mutsuyoshi, T. Kita, and A. Machida July-Aug. 1993	462
Ductility	
—Circular columns—Multi-directional seismic attack (90-S20) Mar.-Apr. 1993	180
—Compressive struts confined by plain concrete (90-S55) Sept.-Oct. 1993	534
—Confined concrete using spiral reinforcement (90-S56) Sept.-Oct. 1993	542
—Flat slabs with and without shear reinforcement (90-S37) July-Aug. 1993	342
—High-strength lightweight aggregate concrete beams—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Structural walls—Seismic design of reinforced concrete and masonry buildings (90-S41) July-Aug. 1993	385
Durability	
—Concrete and mortar cured in hot dry environment—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Glass/epoxy strands in concrete—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—High-performance concrete mixtures for aggressive environments—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Lightweight concrete in severe environment—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Lightweight microsilica concrete—United States applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Steel and fiberglass pretensioned beams (90-S54) Sept.-Oct. 1993	525
—Structural lightweight concrete—Long-term behavior study—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Temperature-strength relationship—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Durability of fiberglass pretensioned beams (90-S54) Rajan Sen, Daniel Mariscal, and Mohsen Shahawy Sept.-Oct. 1993	525
Durability of lightweight concrete and its connections with the composition of concrete, design, and construction methods—Symposium abstract, SP 136-7 (90-AB) Alexander M. Vaysburd Jan.-Feb. 1993	128
Durable concrete in hot climates—Symposium abstract, SP-139 (90-AB) ACI Committee 201 Sept.-Oct. 1993	584

E

Earthquake resistant structures

—Beam-column joints strengthened by epoxy-bonded steel plates (90-S19) Mar.-Apr. 1993	170
—Bridge piers with one-way hinges—Lateral load tests (90-S59) Sept.-Oct. 1993	568
—Circular reinforced columns—Shear strength and deformation characteristics (90-S20) Mar.-Apr. 1993	180

—Columns with interlocking spirals as shear reinforcement (90-S21) Mar.-Apr. 1993	192
—Double-deck viaducts—Proof test of a retrofit concept (90-S62) Nov.-Dec. 1993	616
—Double-deck viaducts in San Francisco—Design deficiencies (90-S48) Sept.-Oct. 1993	467
—Ductile structural walls—Inelastic lateral instability—Design recommendations (90-S41) July-Aug. 1993	385
—Fiber composites for cast-in-place connection (90-S34) May-June 1993	316
—Jacketed beam-column joints (90-S26) May-June 1993	249
—Nonductile reinforced concrete moment-resisting frames—Seismic retrofit techniques (90-S45) July-Aug. 1993	432
Earthquakes—Repair and strengthening reinforced concrete buildings in Israel (90-S19) Mar.-Apr. 1993	170
Effect of curing temperature on the chloride ion diffusion of superplasticized cement and fly ash cement pastes—Symposium abstract, SP 139-4 (90-AB) J. G. Cabrera, T. A. H. Dodd, and S. O. Nwaubani Sept.-Oct. 1993	584
Effect of deformation height and spacing on bond strength of reinforcing bars (90-S65) David Darwin and Ebenezer K. Graham Nov.-Dec. 1993	646
Effect of hot weather conditions on the microcracking and corrosion cracking potential of reinforced concrete—Symposium abstract, SP 139-1 (90-AB) Rasheeduzzafar and S. M. A. Al-Kurdi Sept.-Oct. 1993	584
Effect of reinforcement ratio on the effective moment of inertia of reinforced concrete beams (90-S15) Abdulrahman H. Al-Shaikh and Rajeh Z. Al-Zaid Mar.-Apr. 1993	144
Effect of soil deformability on rigidity—Related aspects of multistory building analysis (90-S17) Adrian S. Scarlat Mar.-Apr. 1993	156
Effect of temperature on cathodic protection criterion for reinforced concrete structures—Symposium abstract, SP 139-2 (90-AB) Rasheeduzzafar and M. G. Ali Sept.-Oct. 1993	584
Ehsani, Mohammad R.	
—Behavior of externally confined concrete columns—Symposium abstract, SP 138-16 (90-AB) July-Aug. 1993	461
—Bond of GFRP rebars to ordinary-strength concrete—Symposium abstract, SP 138-21 (90-AB) July-Aug. 1993	461
—Flexural behavior of masonry walls strengthened with composite fabrics—Symposium abstract, SP 138-30 (90-AB) July-Aug. 1993	462
Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) B. A. Clark, E. A. Draper, R. J. Lee, J. Skalny, M. Ben-Bassat, and A. Bentur Sept.-Oct. 1993	584
Elkafrawy, W.—Flexural behavior of masonry walls strengthened with composite fabrics—Symposium abstract, SP 138-30 (90-AB) July-Aug. 1993	462
Elliot, Eleanor—Disc. closure Serviceability of circular prestressed concrete tanks (89-S34) May-June 1993	221
Ellis, Reed M.—Tests on arch-shaped ice-resisting walls for offshore structures (90-S6) Jan.-Feb. 1993	42
Elnashai, A. S.—Interpretation of testing results for reinforced concrete panels (90-S64) Nov.-Dec. 1993	642
El-Niema, E. I.—Fiber reinforced concrete beams under torsion (90-S50) Sept.-Oct. 1993	489
El-Shahhat, Ashraf M.—Construction safety of multistory concrete buildings (90-S36) July-Aug. 1993	335
Embedment—Precast concrete—ACI 318 provisions—Committee report (90-S13) Jan.-Feb. 1993	115
Energy dissipation—Connections between precast members—Fibrous concrete behavior (90-S34) May-June 1993	316
Enomoto, Tsuyoshi—Report on the use of CFCC in prestressed concrete bridges in Japan—Symposium abstract, SP 138-52 (90-AB) July-Aug. 1993	462
Environments—Hot, dry—Concrete properties and performance—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Epoxy-coated reinforcement under repeated loading (90-S47) D. B. Cleary and J. A. Ramirez July-Aug. 1993	451
Epoxy resins	
—Bond strength of coated bar splices (90-S10) Jan.-Feb. 1993	77
—Bond strength of coated reinforcing bars (90-S47) July-Aug. 1993	451
—Joint repairs—Apartment buildings with open ground story (90-S19) Mar.-Apr. 1993	170
—Modification of concrete—Properties and mix proportioning—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
—Splice strength of deformed reinforcing bars (90-S11) Jan.-Feb. 1993	89
Epoxy-socketed anchors for nonmetallic prestressing tendons—Symposium abstract, SP 138-24 (90-AB) Lars E. Holthe, Charles W. Dolan, and Richard J. Schmidt July-Aug. 1993	461
Equipment—Foundation engineering and construction methodologies in current use—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Ernzen, J. J.—Salt saturated mass concrete under chemical attack—Symposium abstract, SP 140-12 (90-AB) Nov.-Dec. 1993	703
Erosion of concrete in hydraulic structures, ACI 210R-87—Proposed revision (90-CA) ACI Committee 210 May-June 1993	331
Ersay, Ugur—Behavior of jacketed columns (90-S30) May-June 1993	288
Esters—Unsaturated polyester resin polymer concrete performance—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460

Evaluation —Fiber reinforced plastic—Substitute structural material for steel bar—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Evaluation items and methods of FRP reinforcement as structural elements —Symposium abstract, SP-138-8 (90-AB) Shigeru Mochizuki, Yasuhiro Matsuzaki, and Minoru Sugita July-Aug. 1993	461
Evaluation of FRP as reinforcement for concrete bridges —Symposium abstract, SP-138-5 (90-AB) A. H. Rahman, D. A. Taylor, and C. Y. Kingsley July-Aug. 1993	461
Evaluation of permissible crack width on FRP reinforced concrete member —Symposium abstract, SP-138-41 (90-AB) Y. Kaneko, H. Seki, M. Matsushima, and K. Matsui July-Aug. 1993	462
Experimental study on tensile strength of bent portion of FRP rods —Symposium abstract, SP-138-11 (90-AB) Takehiko Maruyama, Masato Honma, and Hajime Okamura July-Aug. 1993	461

F

Fabric —Aramid fibers used as tensile reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Faerman, E. —Advances in underwater concreting: St. Lucie plant intake velocity cap rehabilitation—Symposium abstract, SP-140-9 (90-AB) Nov.-Dec. 1993	703
Failures	
—Channel-anchoring devices (90-S43) July-Aug. 1993	407
—Connections between precast elements under cyclic loads (90-S34) May-June 1993	316
—Hooked bars with and without epoxy coating—Anchorage capacity (90-S23) Mar.-Apr. 1993	210
—Modes—Beams with and without external prestressing tendons (90-S69) Nov.-Dec. 1993	683
—Modes for I-shaped flanged beams—Test and analysis (90-S61) Nov.-Dec. 1993	601
—Multistory buildings—Construction load effects (90-S36) July-Aug. 1993	335
—Punching—Deck slabs in girder type bridges (90-S5) Jan.-Feb. 1993	37
Fairbairn, Daniel R. —Reinforced blockwork masonry columns (90-S51) Sept.-Oct. 1993	496
Falamaki, Masood —Disc. closure Punching shear tests of half-scale reinforced concrete flat-plate models with spandrel beams (89-S25) Mar.-Apr. 1993	219
Farhey, Daniel N. —Cyclic behavior of epoxy-repaired reinforced concrete beam-column joints (90-S19) Mar.-Apr. 1993	170
Fatigue —Epoxy-coated reinforcement under repeated loading (90-S47) July-Aug. 1993	451
Fatigue strength and endurance limit of lightweight concrete —Symposium abstract, SP-136-12 (90-AB) V. Ramakrishnan, T. W. Bremner, and V. M. Mahotra Jan.-Feb. 1993	129
Fatigue tests —Lightweight concretes—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
Faza, Salem S. —Theoretical and experimental correlation of behavior of concrete beams reinforced with fiber reinforced plastic rebars—Symposium abstract, SP-138-36 (90-AB) July-Aug. 1993	462
Feldman, J. A. —Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP-137-7 (90-AB) July-Aug. 1993	460
Ferrocement —Slabs—Punching shear strength (90-S31) May-June 1993	294
Fiber reinforced concrete beams under torsion (90-S50) E. I. El-Niema Sept.-Oct. 1993	489
Fiber reinforced concretes	
—Carbon fiber net crack control effectiveness—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Connections between precast elements in seismic areas (90-S34) May-June 1993	316
—Deflection prediction of beams—Experimental program (90-S9) Jan.-Feb. 1993	72
—E-glass/epoxy spirals—Dynamic analysis of pretensioned piles (90-S67) Nov.-Dec. 1993	666
—Shear behavior of beams with steel fibers (90-S1) Jan.-Feb. 1993	3
—Torsional resistance of beams reinforced with steel fibers (90-S50) Sept.-Oct. 1993	489
Fiber-reinforced-plastic reinforcement for concrete structures—International symposium —Symposium abstract, SP-138 (90-AB) ACI Committee 423 and ACI Committee 440 July-Aug. 1993	461
Fiber reinforced plastics	
—Applications and limitations—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Bonded and unbonded tendons—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Pretensioning concrete—Splitting stress analysis—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Reinforcement for bridges—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Reinforcement for prestressed concrete beams—Mechanical properties—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Stress rupture behavior—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461

Fibers

—Aramid fabric—Applications and properties—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Carbon—Reinforcement material—Flexural behavior—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Continuous reinforcing materials—Design and testing methods—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Steel—High-strength concrete properties (90-S29) May-June 1993	279
Field tests —High-performance concrete highway pavement production evaluation and performance—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Finite element analysis of high-strength concrete slabs (90-S52) H. M. Marzouk and Zhiwei Chen Sept.-Oct. 1993	505
Finite element method —Slab analysis—Reinforced high-strength concrete construction (90-S52) Sept.-Oct. 1993	505
Finite element modeling of corrosion damage in concrete structures (89-S67)	
—H. J. Dagher and S. Kulendran V. 89 Nov.-Dec. 1992, p. 699	
—Disc. by F. J. Molina and J. L. Zapico Sept.-Oct. 1993	579
Fire resistance —Columns with rectangular cross sections (90-S7) Jan.-Feb. 1993	52
Flat slabs	
—Construction safety of multistory buildings (90-S36) July-Aug. 1993	335
—Fibrous lightweight concrete—Ductility and energy-absorption properties (90-S37) July-Aug. 1993	342
Flexural and shear behavior of prestressed concrete beams using FRP rods as prestressing tendons —Symposium abstract, SP-138-32 (90-AB) Asuo Yonekura, Ei-ichi Tazawa, and Hideaki Nakayama July-Aug. 1993	462
Flexural behavior and energy absorption of carbon FRP reinforced concrete beams —Symposium abstract, SP-138-35 (90-AB) Tadahiro Kakizawa, Sadatoshi Ohno, and Toshio Yonezawa July-Aug. 1993	462
Flexural behavior including ductility of high-strength lightweight concrete members under reversed cyclic loading —Symposium abstract, SP-136-10 (90-AB) S. K. Ghosh, Dhruv P. Narielwala, Sung-Woo Shin, and Jaime Moreno Jan.-Feb. 1993	129
Flexural behavior of cementitious composites reinforced by pitch-based high modulus continuous carbon fibers —Symposium abstract, SP-138-17 (90-AB) Takashi Yamada, Kanji Yamada, and Kenji Kubomura July-Aug. 1993	461
Flexural behavior of high-strength fiber reinforced concrete beams (90-S29) Samir A. Ashour and Faisal F. Wafa May-June 1993	279
Flexural behavior of masonry walls strengthened with composite fabrics —Symposium abstract, SP-138-30 (90-AB) M. R. Ehsani, H. Saadatmanesh, I. H. Abdelghany, and W. Elkafrawy July-Aug. 1993	462
Flexural characteristics of prestressed concrete beams with CRFP tendons —Symposium abstract, SP-138-26 (90-AB) Takehiko Kato and Norimitsu Hayashida July-Aug. 1993	461
Flexural deflection of reinforced fibrous concrete beams (90-S9) Saleh H. Alsayed Jan.-Feb. 1993	72
Flexural fatigue behavior of prestressed concrete beams using aramid-fiber tendons —Symposium abstract, SP-138-31 (90-AB) K. Iwamoto, Y. Uchida, N. Takagi, and T. Kojima July-Aug. 1993	462
Flexural performance of concrete beams reinforced with continuous fiber bars —Symposium abstract, SP-138-45 (90-AB) K. Nakano, Y. Matsuzaki, H. Fukuyama, and M. Teshigawara July-Aug. 1993	462
Flexural strength	
—Beams with and without steel fiber reinforcement (90-S9) Jan.-Feb. 1993	72
—High-strength concrete beams with addition of steel fibers (90-S29) May-June 1993	279
—High-strength lightweight concrete members under cyclic loads—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Lightweight concretes made with expanded shale aggregates—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Panels with three-dimensional fabric reinforced concrete—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Reinforced polymer concrete beams using recycled plastic (90-S68) Nov.-Dec. 1993	675
Flexure	
—Columns—ACI Building Code and Mexican Code design requirements (90-S27) May-June 1993	262
—Reinforced concrete long-term deflection prediction using ACI and Canadian codes (90-S39) July-Aug. 1993	364
Flood control —Tunnels in Chicago repaired with high-performance concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Floors —Precast concrete design recommendations—Committee report (90-S13) Jan.-Feb. 1993	115
Flowability —High-performance concrete for bridge construction in Japan—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Fly ash —Cement pastes—Chloride ion diffusion and curing temperature relationship—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Fontana, J. J. —Steel-fiber reinforced polymer concrete—Symposium abstract, SP-137-2 (90-AB) July-Aug. 1993	460
Foundations	
—Drilled piers—Circular tie bar design (90-S24) May-June 1993	231
—Multistory buildings—Rigidity of structural walls and frames (90-S17) Mar.-Apr. 1993	156

—Types and configurations for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Fowler, David W.	
—Recommended design procedure in shear for steel-reinforced polymer concrete (90-S58) Sept.-Oct. 1993	562
—Shear behavior of steel reinforced polymer concrete using recycled plastic (90-S68) Nov.-Dec. 1993	675
Fracture mechanics —Shear capacity of beams with longitudinal reinforcement (90-S60) Nov.-Dec. 1993	591
Frames	
—Column effective length factor—Alternative <i>K</i> -factor equation (90-S25) May-June 1993	242
—Columns with tapered girders—Modified design method (90-S14) Mar.-Apr. 1993	135
—Moment-resisting—Effect of soil deformability of rigidity (90-S17) Mar.-Apr. 1993	156
—Strengthening techniques for reinforced concrete moment-resisting structures (90-S45) July-Aug. 1993	432
—Sway and nonsway—Design for slenderness (90-S32) May-June 1993	302
Freezing and thawing	
—Durability—Air-entrained high-performance concrete optimization—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—High-strength lightweight aggregate concrete durability—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Super-workable concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Fresh concretes —Hot-dry environment—Properties and performance—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
FRP dowel bars in reinforced concrete pavements —Symposium abstract, SP 138-48 (90-AB) Vicki L. Brown and Charles L. Bartholomew July-Aug. 1993	462
FRP tensile elements for prestressed concrete—State of the art, potentials, and limits —Symposium abstract, SP 138-22 (90-AB) F. S. Rostasy July-Aug. 1993	461
Fujisaki, Tadashi —Research and development of grid-shaped FRP reinforcement—Symposium abstract, SP 138-12 (90-AB) July-Aug. 1993	461
Fujisawa, Masami —Bond performance of concrete members reinforced with FRP bars—Symposium abstract, SP 138-46 (90-AB) July-Aug. 1993	462
Fukuyama, Hiroshi	
—Bond performance of concrete members reinforced with FRP bars—Symposium abstract, SP 138-46 (90-AB) July-Aug. 1993	462
—Flexural performance of concrete beams reinforced with continuous fiber bars—Symposium abstract, SP 138-45 (90-AB) July-Aug. 1993	462
—Shear performance of concrete beams reinforced with FRP stirrups—Symposium abstract, SP 138-47 (90-AB) July-Aug. 1993	462
Fundamental properties of continuous fiber bars —Symposium abstract, SP 138-43 (90-AB) Yuuichi Yamasaki, Yoshihiro Masuda, Hiroyuki Tanano, and Akiyuki Shimizu July-Aug. 1993	462
G	
Gambarova, Pietro G. —Cover and stirrup effects on the shear response of dowel bar embedded in concrete (90-S46) July-Aug. 1993	441
Gamble, William L. —Disc. Behavior of columns continuous through concrete floors (89-S40) May-June 1993	329
GangaRao, Hota V. S. —Theoretical and experimental correlation of behavior of concrete beams reinforced with fiber reinforced plastic rebars—Symposium abstract, SP 138-36 (90-AB) July-Aug. 1993	462
Ghali, Amin	
—Deflection of reinforced concrete members: A critical review (90-S39) July-Aug. 1993	364
—Disc. closure Serviceability of circular prestressed concrete tanks (89-S34) May-June 1993	221
Ghosh, S. K.	
—Bond performance of reinforcing bars embedded in high-strength concrete (90-S57) Sept.-Oct. 1993	554
—Flexural behavior including ductility of high-strength lightweight concrete members under reversed cyclic loading—Symposium abstract, SP 136-10 (90-AB) Jan.-Feb. 1993	129
Girders	
—Spliced—Stresses and deformations in composite bridges (90-S3) Jan.-Feb. 1993	21
—Tapered rectangular—Effective length factor for framed columns (90-S14) Mar.-Apr. 1993	135
Glass fibers	
—Bond of fiber reinforced plastic to concrete—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Durability of glass/epoxy pretensioned beams—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Prestressed concrete piles—Dynamic stress measurements (90-S67) Nov.-Dec. 1993	666
—Pretensioned beams—Durability of steel and S-2 glass/epoxy specimens (90-S54) Sept.-Oct. 1993	525
Gosain, Narendra K. —Changes to and applications of development and lap splice length provisions for bars in tension (ACI 318-89) (90-S42) July-Aug. 1993	393

Graham, Ebenezer K. —Effect of deformation height and spacing on bond strength of reinforcing bars (90-S65) Nov.-Dec. 1993	646
Grouts —Equipment foundation applications—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Guide for cellular concrete above 50 pcf with compressive strength less than 2500 psi , ACI 523.3R-75 (Revised 1982) (Reapproved 1987)—Revision (90-CA) ACI Committee 523 July-Aug. 1993	460
Guide for mixing and placing sulfur concrete in construction , ACI 548.2R-88—Revision (90-CA) ACI Committee 548 July-Aug. 1993	460
Guide for the design, construction, and repair of ferrocement , ACI 549.1R-88—Revision (90-CA) ACI Committee 549 July-Aug. 1993	460
Guide to consolidation of concrete in congested areas , ACI 309.3R (89-S55)	
—ACI Committee 309 V. 89 Sept.-Oct. 1992, p. 577	2
—Errata Jan.-Feb. 1993	703
Guide to formwork for concrete , ACI 347R-88 Revision (90-CA) ACI Committee 347 Nov.-Dec. 1993	703
Guideways —Fiber reinforced plastic reinforcement—Performance of structural members—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
H	
Hamad, Bilal S.	
—Anchorage strength of epoxy-coated hooked bars (90-S23) Mar.-Apr. 1993	210
—Strength of epoxy-coated reinforcing bar splices confined with transverse reinforcement (90-S10) Jan.-Feb. 1993	77
Hamid, Ahmad —Properties of hollow concrete masonry reinforced with fiber glass composite—Symposium abstract, SP 138-28 (90-AB) July-Aug. 1993	462
Handling —Precast concrete members—Committee report (90-S13) Jan.-Feb. 1993	115
Hansen, M. R. —Chloride permeability and AC impedance of high-performance concrete—Symposium abstract, SP 140-6 (90-AB) Nov.-Dec. 1993	703
Hardened concretes —Hot-dry environments—Properties and performance—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Hasan, N. —Advances in underwater concreting: St. Lucie plant intake velocity cap rehabilitation—Symposium abstract, SP 140-9 (90-AB) Nov.-Dec. 1993	703
Hasuo, Koichi —Practical application and performance of PPC beams reinforced with braided FRP bars—Symposium abstract, SP 138-51 (90-AB) July-Aug. 1993	462
Hata, S. —Strengthening of damaged concrete beams by external prestressing of aramid fiber cable—Symposium abstract, SP 138-53 (90-AB) July-Aug. 1993	462
Hayakawa, M. —Application of super workable concrete to construction of a 20-story building—Symposium abstract, SP 140-7 (90-AB) Nov.-Dec. 1993	703
Hayashida, Norimitsu —Flexural characteristics of prestressed concrete beams with CRFP tendons—Symposium abstract, SP 138-26 (90-AB) July-Aug. 1993	461
Hendry, Arnold W. —Reinforced blockwork masonry columns (90-S51) Sept.-Oct. 1993	496
Hester, Cynthia J. —Bond of epoxy-coated reinforcement: Splices (90-S11) Jan.-Feb. 1993	89
High-ductility, high-strength lightweight aggregate concrete —Symposium abstract, SP 136-8 (90-AB) Dale E. Berner Jan.-Feb. 1993	128
High-performance concrete for highway applications: Field results —Symposium abstract, SP 140-5 (90-AB) J. J. Schemmel and M. L. Leming Nov.-Dec. 1993	703
High-performance concrete in Florida bridges —Symposium abstract, SP 140-1 (90-AB) J. Armaghani, D. Romano, M. Bergin, and J. Moxley Nov.-Dec. 1993	703
High-performance concrete in severe environments —Symposium abstract, SP-140 (90-AB) ACI Technical Activities Subcommittee on High Performance Concrete (THPC) and cosponsored by RILEM Nov.-Dec. 1993	703
High-performance concrete mixtures for durability —Symposium abstract, SP 140-14 (90-AB) J. M. Shilstone, Sr. and J. M. Shilstone, Jr. Nov.-Dec. 1993	704
High-performance concrete to plug the flooding of the Chicago tunnels —Symposium abstract, SP 140-10 (90-AB) J. Moreno and G. Detwiler Nov.-Dec. 1993	703
High-performance concretes	
—Air-entraining techniques—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Bridge construction case studies—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Chloride permeability and AC impedance test results—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Highway applications and evaluation under field service conditions—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Mass concrete structures—High flowability and compaction—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Nuclear containment—Achievements in France—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703

High-performance concretes in the "Elorn" Bridge —Symposium abstract, SP 140-4 (90-AB) J. Le Bris, P. Redoulez, V. Augustin, J. M. Torrenti, and F. de Larrard Nov.-Dec. 1993	703
High-rise buildings —Super-workable concrete properties and applications—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
High-strength concretes	
—Beam flexural behavior with different fiber contents (90-S29) May-June 1993	279
—Bond performance of embedded reinforcing bars (90-S57) Sept.-Oct. 1993	554
—Lightweight aggregates—Arctic applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Lightweight aggregates—Mechanical properties—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Slabs with heavy reinforcement—Finite element analysis (90-S52) Sept.-Oct. 1993	505
—Ultimate strength under confinement—Triaxial tests (90-S63) Nov.-Dec. 1993	632
High-strength lightweight aggregate concrete for arctic applications: Part 1: Unhardened concrete properties —Symposium abstract, SP 136-1 (90-AB) George C. Hoff Jan.-Feb. 1993	128
High-strength lightweight aggregate concrete for arctic applications: Part 2: Mechanical properties —Symposium abstract, SP 136-2 (90-AB) George C. Hoff Jan.-Feb. 1993	128
High-strength lightweight aggregate concrete for arctic applications: Part 3: Structural parameters —Symposium abstract, SP 136-3 (90-AB) George C. Hoff Jan.-Feb. 1993	128
High temperature	
—Chloride diffusivity in superplasticized cement and fly ash cement paste—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Concrete problems and solutions—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Continuous fiber reinforcement tensile strength—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Highways —High-performance concrete production and long-term performance—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Hinges	
—One-way—Response to shear and moment in strong direction (90-S59) Sept.-Oct. 1993	568
—Plastic—Confining steel design in columns with stubs (90-S44) July-Aug. 1993	414
Hirose, T.	
—RC slabs strengthened by bonded carbon FRP plates: Part 1—Laboratory study—Symposium abstract, SP 138-54 (90-AB) July-Aug. 1993	462
—RC slabs strengthened by bonded carbon FRP plates: Part 2—Application—Symposium abstract, SP 138-55 (90-AB) July-Aug. 1993	462
Hodhod, Hosam —Properties of fiber reinforced plastic rods for prestressing tendons—Symposium abstract, SP 138-7 (90-AB) July-Aug. 1993	461
Hoff, George C.	
—High-strength lightweight aggregate concrete for arctic applications: Part 1: Unhardened concrete properties—Symposium abstract, SP 136-1 (90-AB) Jan.-Feb. 1993	128
—High-strength lightweight aggregate concrete for arctic applications: Part 2: Mechanical properties—Symposium abstract, SP 136-2 (90-AB) Jan.-Feb. 1993	128
—High-strength lightweight aggregate concrete for arctic applications: Part 3: Structural parameters—Symposium abstract, SP 136-3 (90-AB) Jan.-Feb. 1993	128
Holte, Lars E. —Epoxy-socketed anchors for nonmetallic prestressing tendons—Symposium abstract, SP 138-24 (90-AB) July-Aug. 1993	461
Holm, T. A. —Influence of compressive stress on the permeability of concrete—Symposium abstract, SP 136-9 (90-AB) Jan.-Feb. 1993	128
Honma, Masato —Experimental study on tensile strength of bent portion of FRP rods—Symposium abstract, SP 138-11 (90-AB) July-Aug. 1993	461
Hoops —Performance as confinement reinforcement (90-S56) Sept.-Oct. 1993	542
Horiguchi, T. —Strengthening of damaged concrete beams by external prestressing of aramid fiber cable—Symposium abstract, SP 138-53 (90-AB) July-Aug. 1993	462
Hoshijima, Tokitaro —Strengthening of reinforced concrete chimneys, columns, and beams with carbon fiber reinforced plastics—Symposium abstract, SP 138-15 (90-AB) July-Aug. 1993	461
Hot weather concreting	
—Effects on fresh and hardened concrete—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Precautions for large placements and thick sections—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
HPC for the improvement of tightness of nuclear reactor containments in case of severe accidents —Symposium abstract, SP 140-11 (90-AB) G. J. B. Ithuralde and J. L. Costaz Nov.-Dec. 1993	703
Hu, Yu-Xia —On effective length factor of framed columns in the ACI Building Code (90-S14) Mar.-Apr. 1993	135
Humidity —Quality and compressive strength of concrete—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Huyke-Luigi, R. —Strength of concrete cured under various conditions in tropical climates—Symposium abstract, SP 139-10 (90-AB) Sept.-Oct. 1993	584
I-beams	
—Lightweight concrete—Role of steel fibers on shear behavior (90-S12) Jan.-Feb. 1993	103
—Reinforced concrete slender form—Structural behavior (90-S61) Nov.-Dec. 1993	601
Ice —Loads—Arch-shaped walls—Compressive and flexural failure modes (90-S6) Jan.-Feb. 1993	42
Ichimasa, H.	
—RC slabs strengthened by bonded carbon FRP plates: Part 1—Laboratory study—Symposium abstract, SP 138-54 (90-AB) July-Aug. 1993	462
—RC slabs strengthened by bonded carbon FRP plates: Part 2—Application—Symposium abstract, SP 138-55 (90-AB) July-Aug. 1993	462
Idun, Emmanuel K. —Disc. closure Development length criteria: Bars not confined by transverse reinforcement (89-S68) Sept.-Oct. 1993	581
Ikeda, T. —Strengthening of damaged concrete beams by external prestressing of aramid fiber cable—Symposium abstract, SP 138-53 (90-AB) July-Aug. 1993	462
Impact tests —Fiberglass pretensioned piles—Performance evaluation (90-S67) Nov.-Dec. 1993	666
Influence of compressive stress on the permeability of concrete —Symposium abstract, SP 136-9 (90-AB) T. W. Bremner, T. A. Holm, and J. M. McInerney Jan.-Feb. 1993	128
Influence of controlled permeability formwork liner on the quality of the cover concrete —Symposium abstract, SP 139-6 (90-AB) A. A. Sha'at, A. E. Long, F. R. Montgomery, and P. A. M. Basheer Sept.-Oct. 1993	584
Influence of steel fibers on the shear resistance of lightweight concrete I-beams (90-S12)	
—R. Narayan Swamy, Roy Jones, and Andy T. P. Chiam Jan.-Feb. 1993	103
—Errata Mar.-Apr. 1993	134
Initial and time-dependent deformation of progressively cracking nonprestressed and partially prestressed concrete beams (90-S49) Susanto Teng and Dan E. Branson Sept.-Oct. 1993	480
Inomata, M. —Strengthening of damaged concrete beams by external prestressing of aramid fiber cable—Symposium abstract, SP 138-53 (90-AB) July-Aug. 1993	462
Interpretation of testing results for reinforced concrete panels (90-S64) K. Pilakoutas and A. S. Elnashai (90-S64) Nov.-Dec. 1993	642
Investigation of bond in concrete member with fiber reinforced plastic bars —Symposium abstract, SP 138-20 (90-AB) E. Makitani, I. Irisawa, and N. Nishiura July-Aug. 1993	461
Investigation of S-2 glass/epoxy strands in concrete —Symposium abstract, SP 138-2 (90-AB) Rajan Sen, Daniel Mariscal, and Mohsen Shahawy July-Aug. 1993	461
Irisawa, I. —Investigation of bond in concrete member with fiber reinforced plastic bars—Symposium abstract, SP 138-20 (90-AB) July-Aug. 1993	461
Irwin, R. J. —Method to calculate the fire resistance of reinforced concrete columns with rectangular cross section (90-S7) Jan.-Feb. 1993	52
Issa, Mohsen —Driving stresses in fiberglass pretensioned piles (90-S67) Nov.-Dec. 1993	666
Ithuralde, G. J. B. —HPC for the improvement of tightness of nuclear reactor containments in case of severe accidents—Symposium abstract, SP 140-11 (90-AB) Nov.-Dec. 1993	703
Iwamoto, Kaoru	
—Bond characteristics of FRP rod and concrete after freezing and thawing deterioration—Symposium abstract, SP 138-4 (90-AB) July-Aug. 1993	461
—Flexural fatigue behavior of prestressed concrete beams using aramid-fiber tendons—Symposium abstract, SP 138-31 (90-AB) July-Aug. 1993	462
Iyer, Srinivasa L. —Advanced composite demonstration bridge deck—Symposium abstract, SP 138-49 (90-AB) July-Aug. 1993	462
Jaeger, Leslie G. —Disc. Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Nov.-Dec. 1993	700
Jensen, Jens Jacob —Strain development and static compressive strength of concrete exposed to water pressure loading (90-S33) May-June 1993	310
Jeong, S. M. —Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation—Symposium abstract, SP 138-27 (90-AB) July-Aug. 1993	462
Jiang, E. D. —Pore structure and carbonation of lightweight concrete after 10 years' exposure—Symposium abstract, SP 136-11 (90-AB) Jan.-Feb. 1993	129
Jirsa, James O.	
—Anchorage strength of epoxy-coated hooked bars (90-S23) Mar.-Apr. 1993	210
—Strength of epoxy-coated reinforcing bar splices confined with transverse reinforcement (90-S10) Jan.-Feb. 1993	77
—Strength of reinforced concrete frame connections rehabilitated by jack-	

eting (90-S26) May-June 1993	249
—Strengthening of column splices for seismic retrofit of nonductile reinforced concrete frames (90-S45) July-Aug. 1993	432
Joins	
—Beam-column—Design variables—Influence on strength and behavior (90-S8) Jan.-Feb. 1993	61
—Beam-column—Epoxy repair technique (90-S19) Mar.-Apr. 1993	170
—Beam-column—Jacketing repair method (90-S26) May-June 1993	249
—Circular columns—Shear performance of column/beam regions (90-S62) Nov.-Dec. 1993	616
Joins between reinforced concrete members of similar depth (89-S28)	
—A. H. Mattock and J. F. Shen May-June 1992, p. 290	
—Disc. by Andor Windisch and authors Mar.-Apr. 1993	220
Jones, Roy —Influence of steel fibers on the shear resistance of lightweight concrete I-beams (90-S12) Jan.-Feb. 1993	103
Jorgensen, Ib Falk —Disc. Serviceability of circular prestressed concrete tanks (89-S34) May-June 1993	221

K

K-factor equation to alignment charts for column design (90-S25) Lian Duan, Won-Sun King, and Wai-Fah Chen May-June 1993	242
Kagaya, M. —Precast reinforced concrete pipe lined with polymer mortar—Symposium abstract, SP 137-1 (90-AB) July-Aug. 1993	460
Kakizawa, Tadashi —Flexural behavior and energy absorption of carbon FRP reinforced concrete beams—Symposium abstract, SP 138-35 (90-AB) July-Aug. 1993	462
Kakuta, Y. —Design concept for concrete members using continuous fiber reinforced materials—Symposium abstract, SP 138-33 (90-AB) July-Aug. 1993	462
Kanakubo, Toshiyuki —Bond performance of concrete members reinforced with FRP bars—Symposium abstract, SP 138-46 (90-AB) July-Aug. 1993	462
Kaneko, Y. —Evaluation of permissible crack width on FRP reinforced concrete member—Symposium abstract, SP 138-41 (90-AB) July-Aug. 1993	462
Kareem, K.	
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 1993	37
—Closure (90-S5) Nov.-Dec. 1993	700
Karihaloo, B. L. —Shear capacity of longitudinally reinforced beams—A fracture mechanics approach (90-S60) Nov.-Dec. 1993	591
Kasperkiewicz, Janusz —Aramid fabric as a reinforcement of concrete—Symposium abstract, SP 138-10 (90-AB) July-Aug. 1993	461
Kato, Takehiko —Flexural characteristics of prestressed concrete beams with CRFP tendons—Symposium abstract, SP 138-26 (90-AB) July-Aug. 1993	461
Kawaguchi, Naotaka —Ultimate strength and deformation characteristics of concrete members reinforced with AFRP rods under combined axial tension or compression and bending—Symposium abstract, SP 138-40 (90-AB) July-Aug. 1993	462
Kawakami, M. —Precast reinforced concrete pipe lined with polymer mortar—Symposium abstract, SP 137-1 (90-AB) July-Aug. 1993	460
Kayani, M. K. —Disc. Behavior of columns continuous through concrete floors (89-S40) May-June 1993	329
Kepler, W. F. —Development of very low heat mass concrete mixtures for the modification of Theodore Roosevelt Dam—Symposium abstract, SP 140-13 (90-AB) Nov.-Dec. 1993	704
Khalaf, Fouad M. —Reinforced blockwork masonry columns (90-S51) Sept.-Oct. 1993	496
Khouri, Shafik S. —Confined concrete columns with stubs (90-S44) July-Aug. 1993	414
Kimura, Hiroshi —Report on the use of CFCC in prestressed concrete bridges in Japan—Symposium abstract, SP 138-52 (90-AB) July-Aug. 1993	462
King, Won-Sun	
—K-factor equation to alignment charts for column design (90-S25) May-June 1993	242
—On effective length factor of framed columns in the ACI Building Code (90-S14) Mar.-Apr. 1993	135
Kingsley, C. Y. —Evaluation of FRP as reinforcement for concrete bridges—Symposium abstract, SP 138-5 (90-AB) July-Aug. 1993	461
Kishi, Norimitsu —Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods—Symposium abstract, SP 138-19 (90-AB) July-Aug. 1993	461
Kita, T. —Ductile behavior of beams using FRP as tendons and transverse reinforcement—Symposium abstract, SP 138-39 (90-AB) July-Aug. 1993	462
Kiuchi, Takeo —Report on the use of CFCC in prestressed concrete bridges in Japan—Symposium abstract, SP 138-52 (90-AB) July-Aug. 1993	462
Kiyomiya, Osamu —Mechanical properties of composite beams by FRP—Symposium abstract, SP 138-9 (90-AB) July-Aug. 1993	461
Klingner, R. E. —Bond stress model for design of adhesive anchors (90-S53) Sept.-Oct. 1993	514
Kobayashi, M. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) July-Aug. 1993	461

Kojima, T. —Flexural fatigue behavior of prestressed concrete beams using aramid-fiber tendons—Symposium abstract, SP 138-31 (90-AB) July-Aug. 1993	462
Kotsos, Michael D.	
—Design model for structural concrete based on the concept of the compressive force path (90-S2) Jan.-Feb. 1993	12
—Closure (90-S2) Nov.-Dec. 1993	699
Kreger, Michael E. —Strengthening of column splices for seismic retrofit of nonductile reinforced concrete frames (90-S45) July-Aug. 1993	432
Kubomura, Kenji —Flexural behavior of cementitious composites reinforced by pitch-based high modulus continuous carbon fibers—Symposium abstract, SP 138-17 (90-AB) July-Aug. 1993	461
Kumagai, Shin'ichiro	
—Characteristics of aramid FRP rods—Symposium abstract, SP 138-3 (90-AB) July-Aug. 1993	461
—Practical applications of aramid FRP rods to prestressed concrete structures—Symposium abstract, SP 138-50 (90-AB) July-Aug. 1993	462
Kumahara, Susumu —Tensile strength of continuous fiber bar under high temperature—Symposium abstract, SP 138-44 (90-AB) July-Aug. 1993	462
Kuroiwa, S. —Application of super workable concrete to construction of a 20-story building—Symposium abstract, SP 140-7 (90-AB) Nov.-Dec. 1993	703
Kuzuba, Yasuji —Report on the use of CFCC in prestressed concrete bridges in Japan—Symposium abstract, SP 138-52 (90-AB) July-Aug. 1993	462

L

Larrañe, Jesus —Properties of hollow concrete masonry reinforced with fiber glass composite—Symposium abstract, SP 138-28 (90-AB) July-Aug. 1993	462
Lateral confinement of concrete using FRP reinforcement —Symposium abstract, SP 138-13 (90-AB) Antonio Nanni, Michael S. Norris, and Nick M. Bradford July-Aug. 1993	461
Lateral pressure —Industrial equipment on concrete foundations—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Leakage —Water containment structures—Watertightness criteria and method of testing—Committee report (90-S35) May-June 1993	324
Leakage rate —Watertightness test for concrete water containment structures—Committee report (90-S35) May-June 1993	324
Le Bris, J. —High-performance concretes in the "Elom" Bridge—Symposium abstract, SP 140-4 (90-AB) Nov.-Dec. 1993	703
Lee, Douglas Dongwoo —Disc. Development length criteria: Bars not confined by transverse reinforcement (89-S68) Sept.-Oct. 1993	581
Lee, R. J. —Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Lee, S. L. —Concreting of thick sections in the tropics—Symposium abstract, SP 139-9 (90-AB) Sept.-Oct. 1993	584
Leming, M. L.	
—Chloride permeability and AC impedance of high-performance concrete—Symposium abstract, SP 140-6 (90-AB) Nov.-Dec. 1993	703
—High-performance concrete for highway applications: Field results—Symposium abstract, SP 140-5 (90-AB) Nov.-Dec. 1993	703
Lenschow, Rolf —Strain development and static compressive strength of concrete exposed to water pressure loading (90-S33) May-June 1993	310
Li, Chun Qing —Time-dependent structural serviceability analysis of concrete structures (90-S22) Chun Qing Li Mar.-Apr. 1993	204
Li, Mu-Wen —Behavior of externally confined concrete columns—Symposium abstract, SP 138-16 (90-AB) July-Aug. 1993	461
Lie, T. T. —Method to calculate the fire resistance of reinforced concrete columns with rectangular cross section (90-S7) Jan.-Feb. 1993	52
Lightweight aggregate concretes	
—Offshore arctic structures—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Permeability—Influence of compressive stress—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
Lightweight aggregates —Silica fume concrete—Performance evaluation in large structures—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
Lightweight concrete bridges for California highway system —Symposium abstract, SP 136-5 (90-AB) James E. Roberts Jan.-Feb. 1993	128
Lightweight concretes	
—Advantages and applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Composition, design, and construction methods—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Flexural fatigue strength and endurance limit—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Pore structure and carbonation—Short- and long-term behavior—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Steel fiber influence on shear resistance of I-beams (90-S12) Jan.-Feb. 1993	103
—Steel fibers—Strength characteristic of slab-column connections (90-S37) July-Aug. 1993	342
Lightweight microsilica (silica fume) concrete use in the U.S.A. —Symposium abstract, SP 136-6 (90-AB) Mark D. Luther Jan.-Feb. 1993	128
Lilly, William F. —Disc. Critical assessment of ACI 318 Eq. (18-3) for prestressing steel stress at ultimate flexure (89-S50) Sept.-Oct. 1993	577

Linings —Polymer mortar used in reinforced concrete pipe—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Load-deflection curve	
—Beams with different reinforcement ratios (90-S15) Mar.-Apr. 1993	144
—Channel anchor shear and pullout capacity in thin slabs (90-S43) July-Aug. 1993	407
—Ferrocement slab under punching shear load (90-S31) May-June 1993	294
Load factors —Static equipment foundation design criteria—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Load tests	
—Beams with coated and uncoated reinforcement—Bond strength (90-S47) July-Aug. 1993	451
—Fiberglass pretensioned beams—Strength and durability (90-S54) Sept.-Oct. 1993	525
—Reinforced blockwork masonry columns (90-S51) Sept.-Oct. 1993	496
Loads	
—Biaxial—Arbitrarily shaped reinforced concrete column design (90-S28) May-June 1993	269
—Channel anchor behavior under combined shear and tension (90-S43) July-Aug. 1993	407
—Failure—Flanged slender reinforced concrete beams (90-S61) Nov.-Dec. 1993	601
—Longitudinal—Analysis of reinforced concrete sections (90-S18) Mar.-Apr. 1993	163
—Seismic—Column cap-beam/edge-beam joint performance (90-S62) Nov.-Dec. 1993	616
—Triaxial—Ultimate strength criterion for very high-strength concrete (90-S63) Nov.-Dec. 1993	632
—Uniaxial—Jacketed column behavior (90-S30) May-June 1993	288
—Water pressure—Strain development and static compressive strength of concrete (90-S33) May-June 1993	310
Long, A. E. —Influence of controlled permeability formwork liner on the quality of the cover concrete—Symposium abstract, SP 139-6 (90-AB) Sept.-Oct. 1993	584
Loo, Yew-Chay —Disc. closure Punching shear tests of half-scale reinforced concrete flat-plate models with spandrel beams (89-S25) Mar.-Apr. 1993	219
Loss of punching capacity of bridge deck slabs from crack damage (90-S5)	
—A. K. Azad, M. H. Baluch, M. Y. Al-Mandil, A. M. Sharif, and K. Kareem Jan.-Feb. 1993	37
—Disc. by Baidar Bakht, Aftab A. Mufti, and Leslie G. Jaeger, and authors Nov.-Dec. 1993	700
Luther, Mark D. —Lightweight microsilica (silica fume) concrete use in the U.S.A.—Symposium abstract, SP 136-6 (90-AB) Jan.-Feb. 1993	128
Lutz, LeRoy A. —Changes to and applications of development and lap splice length provisions for bars in tension (ACI 318-89) (90-S42) July-Aug. 1993	393

M

MacGregor, James G.	
—Design of slender concrete columns—Revisited (90-S32) May-June 1993	302
—Tests on arch-shaped ice-resisting walls for offshore structures (90-S6) Jan.-Feb. 1993	42
Machida, A.	
—Behavior of prestressed concrete beams using FRP as external cable—Symposium abstract, SP 138-25 (90-AB) July-Aug. 1993	461
—Ductile behavior of beams using FRP as tendons and transverse reinforcement—Symposium abstract, SP 138-39 (90-AB) July-Aug. 1993	462
Madugula, Murty K. S. —Design of tie bars for large drilled pier foundations (90-S24) May-June 1993	231
Maeda, Toshikatsu —Strengthening of reinforced concrete chimneys, columns, and beams with carbon fiber reinforced plastics—Symposium abstract, SP 138-15 (90-AB) July-Aug. 1993	461
Makitani, E. —Investigation of bond in concrete member with fiber reinforced plastic bars—Symposium abstract, SP 138-20 (90-AB) July-Aug. 1993	461
Makizumi, Tatsunori —Control of cracking by use of carbon fiber net as reinforcement for concrete—Symposium abstract, SP 138-18 (90-AB) July-Aug. 1993	461
Malhotra, V. M. —Fatigue strength and endurance limit of lightweight concrete—Symposium abstract, SP 136-12 (90-AB) Jan.-Feb. 1993	129
Mani, A. C. —Concreting of thick sections in the tropics—Symposium abstract, SP 139-9 (90-AB) Sept.-Oct. 1993	584
Mansur, M. A. —Disc. closure Partial prestressing in concrete corbels and deep beams (89-S24) Mar.-Apr. 1993	218
Marine atmospheres	
—Fiberglass pretensioned beams—Durability performance (90-S54) Sept.-Oct. 1993	525
—High-performance concrete placing method for velocity cap—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Structural lightweight aggregate concrete applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128

Mariscal, Daniel	
—Durability of fiberglass pretensioned beams (90-S54) Sept.-Oct. 1993	525
—Investigation of S-2 glass/epoxy strands in concrete—Symposium abstract, SP 138-2 (90-AB) July-Aug. 1993	461
Marti, Peter —Disc. Design model for structural concrete based on the concept of the compressive force path (90-S2) Nov.-Dec. 1993	699
Maruyama, M.	
—RC slabs strengthened by bonded carbon FRP plates: Part 1—Laboratory study—Symposium abstract, SP 138-54 (90-AB) July-Aug. 1993	462
—RC slabs strengthened by bonded carbon FRP plates: Part 2—Application—Symposium abstract, SP 138-55 (90-AB) July-Aug. 1993	462
Maruyama, Takehiko —Experimental study on tensile strength of bent portion of FRP rods—Symposium abstract, SP 138-11 (90-AB) July-Aug. 1993	461
Marzouk, H. M. —Finite element analysis of high-strength concrete slabs (90-S52) Sept.-Oct. 1993	505
Mashima, Mitsuyasu —Bond characteristics of FRP rod and concrete after freezing and thawing deterioration—Symposium abstract, SP 138-4 (90-AB) July-Aug. 1993	461
Masonry units —Block—Reinforced and unreinforced column axial load tests (90-S51) Sept.-Oct. 1993	496
Masonry walls	
—Buckling failure under cyclic loads—Design recommendations (90-S41) July-Aug. 1993	385
—Hollow—Glass fiber composite reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Mass concrete	
—Low heat mixture for dam modification—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Radioactive waste disposal—Cement paste chemical degradation in salt saturated environment—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Masuda, Yoshihiro	
—Fundamental properties of continuous fiber bars—Symposium abstract, SP 138-43 (90-AB) July-Aug. 1993	462
—Tensile strength of continuous fiber bar under high temperature—Symposium abstract, SP 138-44 (90-AB) July-Aug. 1993	462
Mathematical model for bond-slip behavior (89-S66)	
—David Z. Yankelovsky, Moshe A. Adin, and Daniel N. Farhey V. 89 Nov.-Dec. 1992, p. 692	
—Errata Jan.-Feb. 1993	2
Mathematical models —Fire resistance of rectangular reinforced concrete columns (90-S7) Jan.-Feb. 1993	52
Matsubara, Sumiyuki —Practical application and performance of PPC beams reinforced with braided FRP bars—Symposium abstract, SP 138-51 (90-AB) July-Aug. 1993	462
Matsui, K. —Evaluation of permissible crack width on FRP reinforced concrete member—Symposium abstract, SP 138-41 (90-AB) July-Aug. 1993	462
Matsuoka, Y. —Application of super workable concrete to construction of a 20-story building—Symposium abstract, SP 140-7 (90-AB) Nov.-Dec. 1993	703
Matsushima, M. —Evaluation of permissible crack width on FRP reinforced concrete member—Symposium abstract, SP 138-41 (90-AB) July-Aug. 1993	462
Matsuzaki, Yasuhiro	
—Evaluation items and methods of FRP reinforcement as structural elements—Symposium abstract, SP 138-8 (90-AB) July-Aug. 1993	461
—Flexural performance of concrete beams reinforced with continuous fiber bars—Symposium abstract, SP 138-45 (90-AB) July-Aug. 1993	462
Mattock, A. H. —Disc. closure Joints between reinforced concrete members of similar depth (89-S28) Mar.-Apr. 1993	220
McCabe, Steven L.	
—Bond of epoxy-coated reinforcement: Splices (90-S11) Jan.-Feb. 1993	89
—Disc. closure Development length criteria: Bars not confined by transverse reinforcement (89-S68) Sept.-Oct. 1993	581
McCullough, B. Frank —Very early post-tensioning of prestressed concrete pavements (90-S66) Nov.-Dec. 1993	658
McInerney, J. M. —Influence of compressive stress on the permeability of concrete—Symposium abstract, SP 136-9 (90-AB) Jan.-Feb. 1993	128
Mechanical properties of composite beams by FRP —Symposium abstract, SP 138-9 (90-AB) Eiji Sueoka, Keiichi Yasuoka, Osamu Kiyomiya, Masao Yamada, and Masuzumi Shikamori July-Aug. 1993	461
Metal fibers	
—Effectiveness as shear reinforcement in lightweight concrete beams (90-S12) Jan.-Feb. 1993	103
—Flexural behavior of high-strength concrete beams (90-S29) May-June 1993	279
—Lightweight concrete—Performance benefits in flat slab construction (90-S37) July-Aug. 1993	342
—Reinforced concrete beam instantaneous deflection calculation (90-S9) Jan.-Feb. 1993	72
—Shear capacity of reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
Method to calculate the fire resistance of reinforced concrete columns with rectangular cross section (90-S7)	
—T. T. Lie and R. J. Irwin Jan.-Feb. 1993	52

—Errata Mar.-Apr. 1993	134
Microcracking	
—Cyclic thermal changes—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—High-strength concrete behavior under confinement (90-S63) Nov.-Dec. 1993	632
Microstructure —Concretes cured under different conditions—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Mikami, Hiroshi —Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods—Symposium abstract, SP 138-19 (90-AB) July-Aug. 1993	461
Mirza, S. Ali —Changes to and applications of development and lap splice length provisions for bars in tension (ACI 318-89) (90-S42) July-Aug. 1993	393
Mitchell, D. —Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993	703
Miura, N. —Application of super workable concrete to reinforced concrete structures with difficult construction conditions—Symposium abstract, SP 140-8 (90-AB) Nov.-Dec. 1993	703
Mix proportioning	
—High-performance air-entrained concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—High-performance concrete for severe environments—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—High-strength lightweight aggregate concrete—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Low heat mass concrete mixtures for dam modifications—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Mizutani, Jun —Practical applications of aramid FRP rods to prestressed concrete structures—Symposium abstract, SP 138-50 (90-AB) July-Aug. 1993	462
Mochizuki, Shigeru —Evaluation items and methods of FRP reinforcement as structural elements—Symposium abstract, SP 138-8 (90-AB) July-Aug. 1993	461
Modeling —Beams simply supported under transverse in-plane loads (90-S2) Jan.-Feb. 1993	12
Models	
—Design method for skeletal structural concrete configuration (90-S2) Jan.-Feb. 1993	12
—Elastic-plastic—High-strength reinforced concrete properties (90-S52) Sept.-Oct. 1993	505
—Strength of externally prestressed beams—Strut-and-tie method (90-S69) Nov.-Dec. 1993	683
—Strut and tie—Bearing strength of confined compressive struts (90-S55) Sept.-Oct. 1993	534
Molina, F. J. —Disc. Finite element modeling of corrosion damage in concrete structures (89-S67) Sept.-Oct. 1993	579
Moment of inertia	
—Beams with heavily and lightly reinforced sections (90-S15) Mar.-Apr. 1993	144
—Cracking analysis of nonprestressed and partially prestressed beams (90-S49) Sept.-Oct. 1993	480
Moments —Redistribution formulas reexamined (90-S16) Mar.-Apr. 1993	150
Monotonic and cyclic response of one-way reinforced concrete bridge pier hinges in the strong direction (90-S59) M. "Saïd" Saïdi and David Straw Sept.-Oct. 1993	568
Montgomery, F. R. —Influence of controlled permeability formwork liner on the quality of the cover concrete—Symposium abstract, SP 139-6 (90-AB) Sept.-Oct. 1993	584
Moreno, Jaime	
—Flexural behavior including ductility of high-strength lightweight concrete members under reversed cyclic loading—Symposium abstract, SP 136-10 (90-AB) Jan.-Feb. 1993	129
—High-performance concrete to plug the flooding of the Chicago tunnels—Symposium abstract, SP 140-10 (90-AB) Nov.-Dec. 1993	703
Mortars —Pozzolanic—Hot dry curing environment—Properties—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Moxley, J. —High-performance concrete in Florida bridges—Symposium abstract, SP 140-1 (90-AB) Nov.-Dec. 1993	703
Mufti, Aftab A. —Disc. Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Nov.-Dec. 1993	700
Mukae, Kunihiko	
—Characteristics of aramid FRP rods—Symposium abstract, SP 138-3 (90-AB) July-Aug. 1993	461
—Practical applications of aramid FRP rods to prestressed concrete structures—Symposium abstract, SP 138-50 (90-AB) July-Aug. 1993	462
Multistory buildings	
—Rigidity of structural walls and frames—Soil deformability (90-S17) Mar.-Apr. 1993	156
—Safety analysis during rapid construction (90-S36) July-Aug. 1993	335
—Upgrading earthquake damaged buildings—Joint repair method (90-S19) Mar.-Apr. 1993	170
Murugappan, K. —Shear behavior of steel fiber reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
Mutsuyoshi, H.	
—Behavior of prestressed concrete beams using FRP as external cable—Symposium abstract, SP 138-25 (90-AB) July-Aug. 1993	461

—Design concept for concrete members using continuous fiber reinforced materials—Symposium abstract, SP 138-33 (90-AB) July-Aug. 1993	462
—Ductile behavior of beams using FRP as tendons and transverse reinforcement—Symposium abstract, SP 138-39 (90-AB) July-Aug. 1993	462

N

Naaman, Antoine E.	
—Cyclic response of fibrous cast-in-place connections in precast beam-column subassemblies (90-S34) May-June 1993	316
—Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation—Symposium abstract, SP 138-27 (90-AB) July-Aug. 1993	462
—Strut-and-tie model for externally prestressed concrete (90-S69) Nov.-Dec. 1993	683
Nagasaka, Tomoya —Shear performance of concrete beams reinforced with FRP stirrups—Symposium abstract, SP 138-47 (90-AB) July-Aug. 1993	462
Nakagawa, H. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) July-Aug. 1993	461
Nakai, Hiroshi —Characteristics of aramid FRP rods—Symposium abstract, SP 138-3 (90-AB) July-Aug. 1993	461
Nakano, K. —Flexural performance of concrete beams reinforced with continuous fiber bars—Symposium abstract, SP 138-45 (90-AB) July-Aug. 1993	462
Nakano, Osamu —Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods—Symposium abstract, SP 138-19 (90-AB) July-Aug. 1993	461
Nakatsuji, Teruyuki —Research and development of grid-shaped FRP reinforcement—Symposium abstract, SP 138-12 (90-AB) July-Aug. 1993	461
Nakayama, H. —Flexural and shear behavior of prestressed concrete beams using FRP rods as prestressing tendons—Symposium abstract, SP 138-32 (90-AB) July-Aug. 1993	462
Nanni, Antonio —Lateral confinement of concrete using FRP reinforcement—Symposium abstract, SP 138-13 (90-AB) July-Aug. 1993	461
Narielwala, Dhruv P. —Flexural behavior including ductility of high-strength lightweight concrete members under reversed cyclic loading—Symposium abstract, SP 136-10 (90-AB) Jan.-Feb. 1993	129
Nasu, R. —Precast reinforced concrete pipe lined with polymer mortar—Symposium abstract, SP 137-1 (90-AB) July-Aug. 1993	460
Nawy, Edward G. —Disc. Control of flexural crack width in cracked prestressed concrete members (89-S13) Jan.-Feb. 1993	122
Neeley, B. D. —Salt saturated mass concrete under chemical attack—Symposium abstract, SP 140-12 (90-AB) Nov.-Dec. 1993	703
New applications and expanding markets for sulfur polymer cement concrete —Symposium abstract, SP 137-4 (90-AB) H. H. Weber, Jr. July-Aug. 1993	460
Nishlura, N. —Investigation of bond in concrete member with fiber reinforced plastic bars—Symposium abstract, SP 138-20 (90-AB) July-Aug. 1993	461
Noritake, Kunitomo —Practical applications of aramid FRP rods to prestressed concrete structures—Symposium abstract, SP 138-50 (90-AB) July-Aug. 1993	462
Norris, Michael S. —Lateral confinement of concrete using FRP reinforcement—Symposium abstract, SP 138-13 (90-AB) July-Aug. 1993	461
Nuclear reactor containment —Tightness function—High-performance concrete applications—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Nuclear reactors —Prestressed high-performance concrete containment research—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Nwaubani, S. O. —Effect of curing temperature on the chloride ion diffusion of superplasticized cement and fly ash cement pastes—Symposium abstract, SP 139-4 (90-AB) Sept.-Oct. 1993	584
O'Brien, J. Scott —Very early post-tensioning of prestressed concrete pavements (90-S66) Nov.-Dec. 1993	658
Offshore structures	
—High-strength lightweight aggregate concrete—Arctic applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Ice-resisting walls—Behavior under extreme loads (90-S6) Jan.-Feb. 1993	42
—Slab analysis—Thick high-strength heavily reinforced concrete behavior (90-S52) Sept.-Oct. 1993	505
Ohama, Y. —Underwater adhesion of polymethyl methacrylate mortars—Symposium abstract, SP 137-6 (90-AB) July-Aug. 1993	460
Ohno, Sadatoshi —Flexural behavior and energy absorption of carbon FRP reinforced concrete beams—Symposium abstract, SP 138-35 (90-AB) July-Aug. 1993	462
Okada, Shin'ichiro —Control of cracking by use of carbon fiber net as reinforcement for concrete—Symposium abstract, SP 138-18 (90-AB) July-Aug. 1993	461

Okamoto, Tadashi —Practical application and performance of PPC beams reinforced with braided FRP bars—Symposium abstract, SP 138-51 (90-AB) July-Aug. 1993	462
Okamura, Hajime Design concept for concrete members using continuous fiber reinforced materials—Symposium abstract, SP 138-33 (90-AB) July-Aug. 1993	462
—Experimental study on tensile strength of bent portion of FRP rods—Symposium abstract, SP 138-11 (90-AB) July-Aug. 1993	461
Oluokun, Francis A. —Behavior of channel anchors in thin slabs under combined shear and tension (pullout) loads (90-S43) July-Aug. 1993	407
On effective length factor of framed columns in the ACI Building Code (90-S14) Yu-Xia Hu, Ren-Gen Zhou, Won-Sun King, Lian Duan, and Wai-Fah Chen Mar.-Apr. 1993	135
Ouchi, T. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) July-Aug. 1993	461
Outline of the National Research Project on the use of FRP reinforcement in concrete building structures in Japan —Symposium abstract, SP 138-42 (90-AB) Yasuhisa Sonobe July-Aug. 1993	462

P

Pantazopoulou, Stavroula —Parametric investigation of joint mechanics (90-S8) Jan.-Feb. 1993	61
Paramasivam, P. —Punching shear strength of ferrocement slabs (90-S31) May-June 1993	294
—Shear behavior of steel fiber reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
Parametric investigation of joint mechanics (90-S8) John Bonacci and Stavroula Pantazopoulou Jan.-Feb. 1993	61
Pareek, S. N. —Underwater adhesion of polymethyl methacrylate mortars—Symposium abstract, SP 137-6 (90-AB) July-Aug. 1993	460
Park, R. —Seismic design and behavior of reinforced concrete columns with interlocking spirals (90-S21) Mar.-Apr. 1993	192
Partial prestressing —Beam time-dependent analysis and cracking behavior (90-S49) Sept.-Oct. 1993	480
—Beams reinforced with braided aramid fiber bars—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Partial prestressing in concrete corbels and deep beams (89-S24) —K. H. Tan and M. A. Mansur V. 89 May-June 1992, p. 251	218
—Disc. by Andor Windisch and authors Mar.-Apr. 1993	218
Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation —Symposium abstract, SP 138-27 (90-AB) A. E. Naaman, K. H. Tan, S. M. Jeong, and F. M. Alkhaiiri July-Aug. 1993	462
Paulay, T. —Response of circular reinforced concrete columns to multi-directional seismic attack (90-S20) Mar.-Apr. 1993	180
—Stability of ductile structural walls (90-S41) July-Aug. 1993	385
Pavements —Fiber reinforced plastic dowel bars—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Prestressed concrete highways (90-S66) Nov.-Dec. 1993	658
Performance —Jacketed joint shear strength (90-S26) May-June 1993	249
Permeability —Formwork liner—Improved surface properties of concrete—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—High-performance concrete for Florida bridges—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Structural lightweight and normal weight concrete—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
Piers —Drilled—Tie bar stress analysis (90-S24) May-June 1993	231
Pigeon, M. —Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The—Symposium abstract, SP 140-3 (90-AB) Nov.-Dec. 1993	703
Pilakoutas, K. —Interpretation of testing results for reinforced concrete panels (90-S64) Nov.-Dec. 1993	642
Pile caps —Compressive struts confined by plain concrete—Bearing strength (90-S55) Sept.-Oct. 1993	534
Piles —Fiberglass pretensioning—Impact load tests (90-S67) Nov.-Dec. 1993	666
Placing —Thick sections in tropical climatic regions—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Plain concrete —Bearing strength of confined compressive struts (90-S55) Sept.-Oct. 1993	534
Plastics, polymers and resins —Bridge deck preventive maintenance systems—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
—Recycled plastic waste in polymer concrete—Shear behavior (90-S68) Nov.-Dec. 1993	675
Poli, Sandro Del —Cover and stirrup effects on the shear response of dowel bar embedded in concrete (90-S46) July-Aug. 1993	441
Polyethylene —Shear behavior of reinforced concrete polymer concrete beams using recycled plastic (90-S68) Nov.-Dec. 1993	675

Polymer concrete

—Reinforced beams—Design procedure for shear (90-S58) Sept.-Oct. 1993	562
—Steel fiber reinforcement—Material evaluation—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
—Steel fiber reinforcement and recycled plastic—Shear behavior (90-S68) Nov.-Dec. 1993	675
Polymer concrete —Symposium abstract, SP-137 (90-AB) ACI Committee 548 July-Aug. 1993	460
Polymethyl methacrylate —Mortars—Underwater placing and bonding tests—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Poole, T. S. —Salt saturated mass concrete under chemical attack—Symposium abstract, SP 140-12 (90-AB) Nov.-Dec. 1993	703
Popovics, S. —Principles of epoxy modification of portland cement concrete—Symposium abstract, SP 137-5 (90-AB) July-Aug. 1993	460
Pore structure and carbonation of lightweight concrete after 10 years' exposure —Symposium abstract, SP 136-11 (90-AB) R. N. Swamy and E. D. Jiang Jan.-Feb. 1993	129
Post-tensioning —Fiber reinforced concrete tendon and anchorage design—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Slab-on-grade highway pavement—Cracking load calculation (90-S66) Nov.-Dec. 1993	658
Pozzolans —Mortars—Performance under different curing environments—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Practical application and performance of PPC beams reinforced with braided FRP bars —Symposium abstract, SP 138-51 (90-AB) Tadashi Okamoto, Sumiyuki Matsubara, Masaharu Tanigaki, and Koichi Hasuo July-Aug. 1993	462
Practical applications of aramid FRP rods to prestressed concrete structures —Symposium abstract, SP 138-50 (90-AB) Kunitomo Noritake, Kunihiro Mukae, Shin'ichiro Kumagai, and Jun Mizutani July-Aug. 1993	462
Precast concrete —Spliced-girder bridges—Stress and deflection computerized analysis (90-S3) Jan.-Feb. 1993	21
—Structural integrity—ACI 318 provisions—Committee report (90-S13) Jan.-Feb. 1993	115
—Structures—Design recommendations—Committee report (90-S13) Jan.-Feb. 1993	115
—Structures in seismic areas—Fibrous cast-in-place connections (90-S34) May-June 1993	316
Precast reinforced concrete pipe lined with polymer mortar —Symposium abstract, SP 137-1 (90-AB) M. Kawakami, H. Tokuda, M. Kagaya, and R. Nasu July-Aug. 1993	460
Precast wall panels —Design recommendations—Committee report (90-S13) Jan.-Feb. 1993	115
Prestressed concrete —Aramid fiber reinforced plastic rods—Performance tests—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Beams—Carbon fiber reinforced plastic tendons—Flexural strength—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Beams—Nonmetallic tendons and external shear reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Beams—Time-dependent prestress loss prediction (90-S49) Sept.-Oct. 1993	480
—External tendons—Strength evaluation of beams (90-S69) Nov.-Dec. 1993	683
—Highway pavement—Post-tensioning at early age (90-S66) Nov.-Dec. 1993	658
—Piles—Steel and fiberglass spirals—Driving stresses compared (90-S67) Nov.-Dec. 1993	666
—Tanks—Stress redistribution due to creep (90-S4) Jan.-Feb. 1993	32
Prestressed concrete beams using nonmetallic tendons and external shear reinforcement —Symposium abstract, SP 138-29 (90-AB) Charles W. Dolan, Wade Rider, Michael J. Chajes, and Michael DeAscanis July-Aug. 1993	462
Prestressing —Aramid-fiber tendons—Flexural fatigue of beams—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—External—Strut-and-tie model for beam strength evaluation (90-S69) Nov.-Dec. 1993	683
—Nonconventional circumferential distribution in tanks (90-S4) Jan.-Feb. 1993	32
—Time-dependent deformation analysis of flexural members (90-S49) Sept.-Oct. 1993	480
Prestressing steels —Fiber reinforced plastic tendons—Bonding studies—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Pretensioning —Durability of S-2 glass/epoxy strands (90-S54) Sept.-Oct. 1993	525
—Fiber reinforced plastic reinforcement—Splitting stress calculation methods—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Priestley, M. J. N. —Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 1—Design concept, details, and model (90-S48) Sept.-Oct. 1993	467
—Proof test of a retrofit concept for the San Francisco double-deck viaducts—Part 2: Test details and results (90-S62) Nov.-Dec. 1993	616

—Response of circular reinforced concrete columns to multi-directional seismic attack (90-S20) Mar.-Apr. 1993	180
—Stability of ductile structural walls (90-S41) July-Aug. 1993	385
Principles of design of FRP tendons and anchorages for post-tensioned concrete —Symposium abstract, SP 138-38 (90-AB) F. S. Rostásy and H. Budelmann July-Aug. 1993	462
Principles of epoxy modification of portland cement concrete —Symposium abstract, SP 137-5 (90-AB) S. Popovics July-Aug. 1993	460
Production methods —High-performance concrete for bridges—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 1 —Design concept, details, and model (90-S48) M. J. N. Priestley, F. Seible, and D. L. Anderson Sept.-Oct. 1993	467
Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 2 —Test details and results (90-S62) M. J. N. Priestley, F. Seible, and D. L. Anderson Nov.-Dec. 1993	616
Properties of fiber reinforced plastic rods for prestressing tendons —Symposium abstract, SP 138-7 (90-AB) Taketo Uomoto and Hosam Modhod July-Aug. 1993	461
Properties of hollow concrete masonry reinforced with fiber glass composite —Symposium abstract, SP 138-28 (90-AB) Ahmad Hamid, Jesus Larraide, and A. Salama July-Aug. 1993	462
Properties of pozzolanic mortars cured in hot dry environments —Symposium abstract, SP 139-5 (90-AB) J. G. Cabrera, P. J. Wainwright, and A. M. Alami Sept.-Oct. 1993	584
Proposed revisions to: Code for concrete reactor vessels and containments (ACI 359-92) —Proposed revision (90-ST) ACI Committee 359 July-Aug. 1993	459
Pultruded FRP grating reinforced concrete slabs —Symposium abstract, SP 138-34 (90-AB) Lawrence C. Bank and Zuhan Xi July-Aug. 1993	462
Punching shear strength of ferrocement slabs (90-S31) P. Paramasivam and K. H. Tan May-June 1993	294
Punching shear tests of concrete slab-column joints containing fiber reinforcement (89-S42) —Scott D. B. Alexander and Sidney H. Simmonds V. 89 July-Aug. 1992, p. 425	
—Disc. by Krishnaiyengar Rajagopalan May-June 1993	330
Punching shear tests of half-scale reinforced concrete flat-plate models with spandrel beams (89-S25) —Masood Falamaki and Yew-Chaye Loo V. 89 May-June 1992, p. 263	
—Disc. by B. Vijaya Rangan and authors Mar.-Apr. 1993	219
—Errata Mar.-Apr. 1993	219

Q

Quality control

—Foundation construction for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
—High-performance concrete production—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Super-workable concrete—New evaluation method—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	767
—Super-workable concrete—Slump flow tests—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703

R

Rahman, A. H. —Evaluation of FRP as reinforcement for concrete bridges—Symposium abstract, SP 138-5 (90-AB) July-Aug. 1993	461
Rajagopalan, Krishnaiyengar —Disc. Punching shear tests of concrete slab-column joints containing fiber reinforcement (89-S42) May-June 1993	330
Ramakrishnan, V. —Fatigue strength and endurance limit of lightweight concrete—Symposium abstract, SP 136-12 (90-AB) Jan.-Feb. 1993	129
Ramirez, J. A. —Epoxy-coated reinforcement under repeated loading (90-S47) July-Aug. 1993	451
Rangan, B. Vijaya —Disc. Punching shear tests of half-scale reinforced concrete flat-plate models with spandrel beams (89-S25) Mar.-Apr. 1993	219
Rasheeduzzafar —Effect of hot weather conditions on the microcracking and corrosion cracking potential of reinforced concrete—Symposium abstract, SP 139-1 (90-AB) Sept.-Oct. 1993	584
—Effect of temperature on cathodic protection criterion for reinforced concrete structures—Symposium abstract, SP 139-2 (90-AB) Sept.-Oct. 1993	584
Ravina, D. —Research on concrete in hot environments at the National Building Research Institute, Haifa, Israel—Symposium abstract, SP 139-7 (90-AB) Sept.-Oct. 1993	584
RC slabs strengthened by bonded carbon FRP plates: Part 1—Laboratory study —Symposium abstract, SP 138-54 (90-AB) H. Ichimatsu, M. Maruyama, H. Watanabe, and T. Hirose July-Aug. 1993	462
RC slabs strengthened by bonded carbon FRP plates: Part 2—Application —Symposium abstract, SP 138-55 (90-AB) H. Ichimatsu, M. Maruyama, H. Watanabe, and T. Hirose July-Aug. 1993	462

Rebeiz, Karim S.

—Recommended design procedure in shear for steel-reinforced polymer concrete (90-S58) Sept.-Oct. 1993	562
—Shear behavior of steel reinforced polymer concrete using recycled plastic (90-S68) Nov.-Dec. 1993	675
Recommended design procedure in shear for steel-reinforced polymer concrete (90-S58) Karim S. Rebeiz, Sleiman P. Serhal, and David W. Fowler Sept.-Oct. 1993	562
Redoulez, P. —High-performance concretes in the "Elorn" Bridge—Symposium abstract, SP 140-4 (90-AB) Nov.-Dec. 1993	703
Reinforced blockwork masonry columns (90-S51) Fouad M. Khalaf, Arnold W. Hendry, and Daniel R. Fairbairn Sept.-Oct. 1993	496
Reinforced concrete —Beam design model—Compressive force path concept (90-S2) Jan.-Feb. 1993	12
—Beams—Effective moment of inertia calculation (90-S15) Mar.-Apr. 1993	144
—Beams—Moment redistribution formula (90-S16) Mar.-Apr. 1993	150
—Bridge piers with one-way hinges—Lateral load performance (90-S59) Sept.-Oct. 1993	568
—Cathodic protection—Effects of hot weather—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Columns under combined loads—Design of odd shaped sections (90-S28) May-June 1993	269
—Columns with rectangular cross sections—Strength during fire exposure (90-S7) Jan.-Feb. 1993	52
—Columns with stubs—Design of confinement steel (90-S44) July-Aug. 1993	414
—Computer analysis of sections under biaxial bending and longitudinal load (90-S18) Mar.-Apr. 1993	163
—Deflection prediction—A critical review (90-S39) July-Aug. 1993	364
—Dowel design and efficiency assessment in shear transfer (90-S46) July-Aug. 1993	441
—Frame structures—Behavior of interior connections (90-S8) Jan.-Feb. 1993	61
—Load and resistance factor—ACI 318-89 and Mexico City design regulations (90-S27) May-June 1993	262
—Microcracking and corrosion cracking in hot weather—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
—Moment-resistant frame—Retrofit scheme for column splices (90-S45) July-Aug. 1993	432
—Structural serviceability—Models for creep and load process (90-S22) Mar.-Apr. 1993	204
—Super-workable concrete applications to special structures—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Wall panels—Load-controlled testing interpretation (90-S64) Nov.-Dec. 1993	642
—Walls—Seismic design (90-S41) July-Aug. 1993	385
—Water containment structures—Watertightness testing and criteria—Committee report (90-S35) May-June 1993	324
Reinforced concrete columns confined by circular spirals and hoops (90-S56) Shamim A. Sheikh and Murat T. Toklucu Sept.-Oct. 1993	542
Reinforced concrete flanged beams—Test and analysis (90-S61) N. K. Subedi Nov.-Dec. 1993	601
Reinforcement —Aramid fiber tendons—Fatigue strength and deformation of beams—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Bond capacity in high-strength concrete—Development and lap splice length (90-S57) Sept.-Oct. 1993	554
—Bond strength of epoxy-coated bars under high-cyclic repeated loads (90-S47) July-Aug. 1993	451
—Carbon fiber composite strands—Behavior in partially prestressed beams—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Circular spirals and hoops—Confined concrete behavior (90-S56) Sept.-Oct. 1993	542
—Confinement effects on development and splice lengths of bars in tension (90-S42) July-Aug. 1993	393
—Continuous fibers—Fundamental properties—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Deformed—Bond-slip mechanics (90-S65) Nov.-Dec. 1993	646
—Epoxy coated—Strength of splices (90-S11) Jan.-Feb. 1993	89
—Epoxy-coated bar splices—Bond strength (90-S10) Jan.-Feb. 1993	77
—Epoxy-coated hooked bars—Anchorage capacity (90-S23) Mar.-Apr. 1993	210
—Fiber reinforced plastic—Mechanical behavior and tensile strength—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Fiber reinforced plastic bars—Bond tests—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Glass fiber composite used in hollow concrete masonry—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Glass fiber reinforced plastic reinforcing bars—Bond properties—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Interlocking spirals—Column seismic design (90-S21) Mar.-Apr. 1993	192
—Longitudinal splitting failure of concrete due to bond stress (90-S60) Nov.-Dec. 1993	591
—Ratio—Beam effective moment of inertia (90-S15) Mar.-Apr. 1993	144
—Shear—Fiber concrete in structural elements (90-S12) Jan.-Feb. 1993	923

—Spiral—Squat circular column shear strength-ductility relationship (90-S20) Mar.-Apr. 1993	180
—Tensile lap splices—Bond provision for tension (90-S40) July-Aug. 1993	374
—Three-dimensional fabric—Building panel applications—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Reinforcing materials	
—Fiber reinforced plastic—Research and development—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Hollow masonry walls reinforced with fiber glass composite—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Reinforcing steels	
—Deformation pattern influence on bond strength (90-S65) Nov.-Dec. 1993	646
—Development length and splices for bars in tension (90-S42) July-Aug. 1993	393
—Flexural deflection of fibrous concrete beams (90-S9) Jan.-Feb. 1993	72
—Splice strength of epoxy-coated and uncoated bars (90-S11) Jan.-Feb. 1993	89
Reinhardt, Hans W. —Aramid fabric as a reinforcement of concrete—Symposium abstract, SP-138-10 (90-AB) July-Aug. 1993	461
Reliability —Load and resistance factors in structural design (90-S27) May-June 1993	262
Reliability associated with safety factors of ACI 318-89 and the Mexico City concrete design regulations (90-S27) Sonia E. Ruiz May-June 1993	262
Repairs	
—Advances in underwater concreting—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Beam-column connections rehabilitated by jacketing (90-S26) May-June 1993	249
—Beam-column joints—Epoxy-bonded steel plates—Cyclic behavior (90-S19) Mar.-Apr. 1993	170
—Columns strengthened by jacketing—Load capacities and deformation capacity (90-S30) May-June 1993	288
Report on the use of CFCC in prestressed concrete bridges in Japan —Symposium abstract, SP-138-52 (90-AB) Norihiko Santoh, Hiroshi Kimura, Tsuyoshi Enomoto, Takeo Kiuchi, and Yasuji Kuzuba July-Aug. 1993	462
Research	
—Fiber reinforced plastic reinforcement in building structures in Japan—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Hot weather concreting problems in Israel—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Research and development of grid-shaped FRP reinforcement —Symposium abstract, SP-138-12 (90-AB) Tadashi Fujisaki, Teruyuki Nakatsui, and Minoru Sugita July-Aug. 1993	461
Research on concrete in hot environments at the National Building Research Institute, Haifa, Israel —Symposium abstract, SP-139-7 (90-AB) D. Ravina and I. Soroka Sept.-Oct. 1993	584
Reservoirs —Reinforced concrete—Watertightness criteria and testing methods—Committee report (90-S35) May-June 1993	324
Response of circular reinforced concrete columns to multi-directional seismic attack (90-S20) Yuk-Lung Wong, T. Paulay, and M. J. Nigel Priestley Mar.-Apr. 1993	180
Rezanoff, Tel —Tensile lap splices under static loading: A review of the proposed ACI 318 code provisions (90-S40) July-Aug. 1993	374
Rider, Wade —Prestressed concrete beams using nonmetallic tendons and external shear reinforcement—Symposium abstract, SP-138-29 (90-AB) July-Aug. 1993	462
Rigidity	
—Beams—High-strength concrete with fiber addition (90-S29) May-June 1993	279
—Multistory building on deformable soil—Structural analysis (90-S17) Mar.-Apr. 1993	156
RILEM —High-performance concrete in severe environments—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Roberts, James E. —Lightweight concrete bridges for California highway system—Symposium abstract, SP-136-5 (90-AB) Jan.-Feb. 1993	128
Roller, John J. —Bond performance of reinforcing bars embedded in high-strength concrete (90-S57) Sept.-Oct. 1993	554
Romano, D. —High-performance concrete in Florida bridges—Symposium abstract, SP-140-1 (90-AB) Nov.-Dec. 1993	703
Rosenberg, A. M. —Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP-137-7 (90-AB) July-Aug. 1993	460
Rosowsky, David V. —Construction safety of multistory concrete buildings (90-S36) July-Aug. 1993	335
Rostásy, F. S.	
—Creep rupture behavior of FRP elements for prestressed concrete—Phenomenon, results, and forecast models—Symposium abstract, SP-138-6 (90-AB) July-Aug. 1993	461
—FRP tensile elements for prestressed concrete—State of the art, potentials, and limits—Symposium abstract, SP-138-22 (90-AB) July-Aug. 1993	461
—Principles of design of FRP tendons and anchorages for post-tensioned concrete—Symposium abstract, SP-138-38 (90-AB) July-Aug. 1993	462

Ruiz, Sonia E.—Reliability associated with safety factors of ACI 318-89 and the Mexico City concrete design regulations (90-S27) May-June 1993
262

S

Saadatmanesh, Hamid	
—Behavior of externally confined concrete columns—Symposium abstract, SP-138-16 (90-AB) July-Aug. 1993	461
—Bond of GFRP rebars to ordinary-strength concrete—Symposium abstract, SP-138-21 (90-AB) July-Aug. 1993	461
—Flexural behavior of masonry walls strengthened with composite fabrics—Symposium abstract, SP-138-30 (90-AB) July-Aug. 1993	462
Sæki, N. —Strengthening of damaged concrete beams by external prestressing of aramid fiber cable—Symposium abstract, SP-138-53 (90-AB) July-Aug. 1993	462
Safety —Multistory concrete buildings during construction—Case study (90-S36) July-Aug. 1993	335
Safety factor —ACI 318-89 and Mexico City concrete design regulations on reinforced concrete (90-S27) May-June 1993	262
Saidi, M. "Saïd" —Monotonic and cyclic response of one-way reinforced concrete bridge pier hinges in the strong direction (90-S59) Sept.-Oct. 1993	568
Sakamoto, Yoshifumi —Control of cracking by use of carbon fiber net as reinforcement for concrete—Symposium abstract, SP-138-18 (90-AB) July-Aug. 1993	461
Salama, Amr —Properties of hollow concrete masonry reinforced with fiber glass composite—Symposium abstract, SP-138-28 (90-AB) July-Aug. 1993	462
Salamizavareh, Shahin —Bond of epoxy-coated reinforcement: Splices (90-S11) Jan.-Feb. 1993	89
Salt saturated mass concrete under chemical attack —Symposium abstract, SP-140-12 (90-AB) L. D. Wakeley, T. S. Poole, J. J. Ernzen, and B. D. Neeley Nov.-Dec. 1993	703
Salt water —Serviceability of concrete seals in chemically severe environment—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Santizo, Luis —Advantages of using lightweight concrete in a medium-rise building and adjoining post-tensioned parking garage—Symposium abstract, SP-136-4 (90-AB) Jan.-Feb. 1993	128
Santoh, Norihiko —Report on the use of CFCC in prestressed concrete bridges in Japan—Symposium abstract, SP-138-52 (90-AB) July-Aug. 1993	462
Sarsam, Kais F. —Disc. closure Shear design of high- and normal strength concrete beams with web reinforcement (89-S62) Sept.-Oct. 1993	578
Sato, K. —Development and utilization of high-performance concrete employed in the Akashi Kaikyo Bridge—Symposium abstract, SP-140-2 (90-AB) Nov.-Dec. 1993	703
Satoyama, K. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP-138-14 (90-AB) July-Aug. 1993	461
Scanlon, J. M. —Concrete problems associated with hot climates—Symposium abstract, SP-139-8 (90-AB) Sept.-Oct. 1993	584
Scarlat, Adrian S. —Effect of soil deformability on rigidity—Related aspects of multistory building analysis (90-S17) Mar.-Apr. 1993	156
Schemmel, J. J. —High-performance concrete for highway applications: Field results—Symposium abstract, SP-140-5 (90-AB) Nov.-Dec. 1993	703
Schmidt, Richard J. —Epoxy-socketed anchors for nonmetallic prestressing tendons—Symposium abstract, SP-138-24 (90-AB) July-Aug. 1993	461
Schoenckase, Steven P. —Disc. closure Development length criteria: Bars not confined by transverse reinforcement (89-S68) Sept.-Oct. 1993	581
Scholz, H. —Contribution to redistribution of moments in continuous reinforced concrete beams (90-S16) Mar.-Apr. 1993	150
Seible, F.	
—Proof test of a retrofit concept for the San Francisco double-deck viaducts: Part 1—Design concept, details, and model (90-S48) Sept.-Oct. 1993	467
—Proof test of a retrofit concept for the San Francisco double-deck viaducts—Part 2: Test details and results (90-S62) Nov.-Dec. 1993	616
Seismic design and behavior of reinforced concrete columns with interlocking spirals (90-S21) H. Tanaka and R. Park Mar.-Apr. 1993	192
Seki, H. —Evaluation of permissible crack width on FRP reinforced concrete member—Symposium abstract, SP-138-41 (90-AB) July-Aug. 1993	462
Sen, Rajan	
—Driving stresses in fiberglass pretensioned piles (90-S67) Nov.-Dec. 1993	666
—Durability of fiberglass pretensioned beams (90-S54) Sept.-Oct. 1993	525
—Investigation of S-2 glass/epoxy strands in concrete—Symposium abstract, SP-138-2 (90-AB) July-Aug. 1993	461
Serhal, Sleiman P.	
—Recommended design procedure in shear for steel-reinforced polymer concrete (90-S58) Sept.-Oct. 1993	562
—Shear behavior of steel reinforced polymer concrete using recycled plastic (90-S68) Nov.-Dec. 1993	675

Serviceability —Time-dependent structural concrete problems (90-S22) Mar.-Apr. 1993	204
Serviceability of circular prestressed concrete tanks (89-S34)	
—Amin Ghali and Eleanor Elliott May-June 1992, p. 345	
—Disc. by Ib Falk Jorgensen and Steven R. Close and authors Mar.-Apr. 1993	221
Setunge, S. —Ultimate strength of confined very high-strength concretes (90-S63) Nov.-Dec. 1993	632
Sewer pipes —Polymer mortar lining—Durability and chemical resistance—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Shah, A. A. —Influence of controlled permeability formwork liner on the quality of the cover concrete—Symposium abstract, SP 139-6 (90-AB) Sept.-Oct. 1993	584
Shahawy, Mohsen	
—Driving stresses in fiberglass pretensioned piles (90-S67) Nov.-Dec. 1993	666
—Durability of fiberglass pretensioned beams (90-S54) Sept.-Oct. 1993	525
—Investigation of S-2 glass/epoxy strands in concrete—Symposium abstract, SP 138-2 (90-AB) July-Aug. 1993	461
Sharif, A. M.	
—Loss of punching capacity of bridge deck slabs from crack damage (90-S5) Jan.-Feb. 1993	37
—Closure (90-S5) Nov.-Dec. 1993	700
Shear	
—Beams—Improved fracture mechanics model (90-S60) Nov.-Dec. 1993	591
—Deep beam and pile cap structural behavior—Strut-and-tie model study (90-S38) July-Aug. 1993	356
—Deformation—Reinforced concrete wall panels—Interpretation of testing (90-S64) Nov.-Dec. 1993	642
—Reinforced polymer concrete—Design procedure (90-S58) Sept.-Oct. 1993	562
—Reinforcement—Nonmetallic fabric—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Transfer—Dowel action in reinforced concrete elements (90-S46) July-Aug. 1993	441
Shear behavior of high-strength fiber reinforced concrete beams (89-S19)	
—Samir A. Ashour, Ghazi S. Hasanain, and Faisal F. Wafa V. 89 Mar.-Apr. 1992, p. 176	
—Disc. by Lionello Bortolotti Jan.-Feb. 1993	126
Shear behavior of steel fiber reinforced concrete beams (90-S1) K. H. Tan, K. Murugappan, and P. Paramasivam Jan.-Feb. 1993	3
Shear behavior of steel reinforced polymer concrete using recycled plastic (90-S68) K. S. Rebeiz, S. Serhal, and D. W. Fowler Nov.-Dec. 1993	675
Shear capacity of longitudinally reinforced beams—A fracture mechanics approach (90-S60) K. O. So and B. L. Karihaloo Nov.-Dec. 1993	591
Shear capacity of RC and PC beams using FRP reinforcement —Symposium abstract, SP 138-37 (90-AB) S. Tottori and H. Wakui July-Aug. 1993	462
Shear design of high- and normal strength concrete beams with web reinforcement (89-S62)	
—Kaiss F. Sarsam and Janan M. S. Al-Musawi V. 89 Nov.-Dec. 1992, p. 658	
—Disc. by Himat Solanki and authors Sept.-Oct. 1993	578
Shear performance of concrete beams reinforced with FRP stirrups —Symposium abstract, SP 138-47 (90-AB) Tomoya Nagasaka, Hiroshi Fukuyama, and Nasaharu Tanigaki July-Aug. 1993	462
Shear strength	
—Beams—Reinforced polymer concrete using recycled plastic (90-S68) Nov.-Dec. 1993	675
—Beams—Steel-reinforced polymer concrete without web reinforcement—Design procedure (90-S58) Sept.-Oct. 1993	562
—Circular columns with spiral reinforcement (90-S20) Mar.-Apr. 1993	180
—Columns with interlocking spirals (90-S21) Mar.-Apr. 1993	192
—Ferrocement slabs (90-S31) May-June 1993	294
—I-beams with fiber reinforcement (90-S12) Jan.-Feb. 1993	103
—Ice load considerations for offshore structures (90-S6) Jan.-Feb. 1993	42
—Jacketed reinforced concrete frame connections (90-S26) May-June 1993	249
—Lightweight concrete slab-column connections—Role of steel fibers (90-S37) July-Aug. 1993	342
—Pile caps with four piles (90-S38) July-Aug. 1993	356
—Steel fiber reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
Shear tests —Channel anchor capacity in thin slabs (90-S43) July-Aug. 1993	407
Shehata, Ibrahim A. E. M. —Disc. Tests of column-flat plate connections (89-S46) Sept.-Oct. 1993	574
Sheikh, Shamim A.	
—Confined concrete columns with stubs (90-S44) July-Aug. 1993	414
—Reinforced concrete columns confined by circular spirals and hoops (90-S56) Sept.-Oct. 1993	542
Shen, J. F. —Disc. closure joints between reinforced concrete members of similar depth (89-S28) Mar.-Apr. 1993	220

Shikamori, Masuzumi —Mechanical properties of composite beams by FRP—Symposium abstract, SP 138-9 (90-AB) July-Aug. 1993	461
Shilstone, J. M., Jr. —High-performance concrete mixtures for durability—Symposium abstract, SP 140-14 (90-AB) Nov.-Dec. 1993	704
Shilstone, J. M., Sr. —High-performance concrete mixtures for durability—Symposium abstract, SP 140-14 (90-AB) Nov.-Dec. 1993	704
Shimizu, Akiyuki	
—Fundamental properties of continuous fiber bars—Symposium abstract, SP 138-43 (90-AB) July-Aug. 1993	462
—Tensile strength of continuous fiber bar under high temperature—Symposium abstract, SP 138-44 (90-AB) July-Aug. 1993	462
Shin, Sung-Woo —Flexural behavior including ductility of high-strength lightweight concrete members under reversed cyclic loading—Symposium abstract, SP 136-10 (90-AB) Jan.-Feb. 1993	129
Shindoh, T. —Application of super workable concrete to construction of a 20-story building—Symposium abstract, SP 140-7 (90-AB) Nov.-Dec. 1993	703
Shock resistance —Slabs reinforced with aramid fiber reinforced plastic rods—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Shoring —Safety of multistory building (90-S36) July-Aug. 1993	335
Should FRP be bonded to concrete? —Symposium abstract, SP 138-23 (90-AB) C. J. Burgoyne July-Aug. 1993	461
Shrinkage cracking in fully restrained concrete members (89-S15)	
—R. Ian Gilbert V. 89 Mar.-Apr. 1992, p. 141	
—Disc. by A. W. Beeby Jan.-Feb. 1993	123
Siao, Wen Bin —Strut-and-tie model for shear behavior in deep beam and pile caps failing in diagonal splitting (90-S38) July-Aug. 1993	356
Sigrist, Viktor —Disc. Design model for structural concrete based on the concept of the compressive force path (90-S2) Nov.-Dec. 1993	699
Silica fume	
—Concrete—Lightweight aggregates—United States applications—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Concrete—Ultimate strength test results (90-S63) Nov.-Dec. 1993	632
Simmonds, Sidney H. —Disc. closure Tests of column-flat plate connections (89-S46) Sept.-Oct. 1993	574
Skalny, J. —Electron-optical evaluation of concrete cured at elevated temperatures—Symposium abstract, SP 139-3 (90-AB) Sept.-Oct. 1993	584
Slabs	
—Aramid fiber reinforced plastic rods—Impact strength—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Ferrocement construction—Behavior under punching shear load (90-S31) May-June 1993	294
—Precast floor and roof design—Committee report (90-S13) Jan.-Feb. 1993	115
—Punching shear strength—Crack geometry (90-S5) Jan.-Feb. 1993	37
—Reinforced high-strength concrete—Finite element model analysis (90-S52) Sept.-Oct. 1993	505
—Strengthening—Bonded carbon fiber reinforced plastic plate applications—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Thin—Channel anchor shear and pullout capacity (90-S43) July-Aug. 1993	407
Slenderness	
—Column—Second-order frame analysis in design (90-S32) May-June 1993	302
—Columns—Stability analysis and design of framed structures (90-S25) May-June 1993	242
—Moment redistribution in continuous reinforced concrete beams (90-S16) Mar.-Apr. 1993	150
Slenderness ratio —Framed column modified design method (90-S14) Mar.-Apr. 1993	135
Slump —Flow—Super-workable concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
So, A. K. W. —Biaxial bending design of arbitrarily shaped reinforced concrete column (90-S28) May-June 1993	269
So, K. O. —Shear capacity of longitudinally reinforced beams—A fracture mechanics approach (90-S60) Nov.-Dec. 1993	591
Sogo, S. —Application of super workable concrete to reinforced concrete structures with difficult construction conditions—Symposium abstract, SP 140-8 (90-AB) Nov.-Dec. 1993	703
Soils —Deformability—Multistory building rigidity and stress analysis (90-S17) Mar.-Apr. 1993	156
Solanki, Himat	
—Disc. Drift response of medium-rise reinforced concrete buildings during earthquakes (89-S37) May-June 1993	329
—Disc. Shear design of high- and normal strength concrete beams with web reinforcement (89-S62) Sept.-Oct. 1993	578
Sonobe, Yasuhisa	
—Bond performance of concrete members reinforced with FRP bars—Symposium abstract, SP 138-46 (90-AB) July-Aug. 1993	462
—Outline of the National Research Project on the use of FRP reinforcement in concrete building structures in Japan—Symposium abstract, SP 138-42 (90-AB) July-Aug. 1993	462
Soroka, I. —Research on concrete in hot environments at the National Building Research Institute, Haifa, Israel—Symposium abstract, SP 139-7 (90-AB) Sept.-Oct. 1993	584
Soubra, Khaled S. —Cyclic response of fibrous cast-in-place connections in precast beam-column subassemblages (90-S34) May-June 1993	316
Span —Depth ratio—Beam shear capacity prediction (90-S60) Nov.-Dec. 1993	591

Sparling, Bruce —Tensile lap splices under static loading: A review of the proposed ACI 318 code provisions (90-S40) July-Aug. 1993	374
Specific heat —Carbon, glass, and aramid fiber reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Splices	
—Lap—ACI 318 code provisions for bond (90-S40) July-Aug. 1993	374
—Tension lapped—ACI 318-83 development lengths compared with tests (90-S42) July-Aug. 1993	393
Splicing	
—Bond of epoxy-coated reinforcement (90-S11) Jan.-Feb. 1993	89
—Bond strength of coated and uncoated bars with transverse reinforcement (90-S10) Jan.-Feb. 1993	77
—Bond strength versus length in high-strength concrete (90-S57) Sept.-Oct. 1993	554
—Girder—Bridge analysis and design (90-S3) Jan.-Feb. 1993	21
Splitting forces in FRPR pretensioned concrete —Symposium abstract, SP 138-1 (90-AB) W. Reinold de Sitter and René A. Vonk July-Aug. 1993	461
Stability	
—Columns in building frames—Analysis and design (90-S25) May-June 1993	242
—Foundations supporting static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
—Sway and nonsway frame analysis and design (90-S32) May-June 1993	302
Stability of ductile structural walls (90-S41) T. Paulay and M. J. N. Priestley (90-S41) July-Aug. 1993	385
Standard specification for latex-modified concrete (LMC) overlays (ACI 548.4-93) (90-ST) ACI Committee 548 Nov.-Dec. 1993	703
Stark, Mark —Bond performance of reinforcing bars embedded in high-strength concrete (90-S57) Sept.-Oct. 1993	554
State-of-the-art report on ferrocement , ACI 549R-88—Revision (90-CA) ACI Committee 549 July-Aug. 1993	460
Static loads —Tensile lap splices in beams—Proposed bond provisions (90-S40) July-Aug. 1993	374
Steel-fiber reinforced polymer concrete —Symposium abstract, SP 137-2 (90-AB) J. J. Fontana July-Aug. 1993	460
Stiffness	
—Fibrous beams under torsion (90-S50) Sept.-Oct. 1993	489
—Moment redistribution in continuous reinforced concrete beams (90-S16) Mar.-Apr. 1993	150
Stirrups	
—Dowel bar embedded in concrete—Shear response (90-S46) July-Aug. 1993	441
—Fiber reinforced plastic—Shear performance of beams—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Strain development and static compressive strength of concrete exposed to water pressure loading (90-S33) Lars Bjerkeli, Jens Jacob Jensen, and Rolf Lenschow May-June 1993	310
Strains	
—Beams with different steel fiber contents (90-S1) Jan.-Feb. 1993	3
—Concrete cylinders exposed to high water pressure loading—Pore pressure development (90-S33) May-June 1993	310
Straw, David —Monotonic and cyclic response of one-way reinforced concrete bridge pier hinges in the strong direction (90-S59) Sept.-Oct. 1993	568
Strength	
—Beams with external prestressing—Proposed analytical model (90-S69) Nov.-Dec. 1993	683
—Columns constructed of reinforced blockwork masonry (90-S51) Sept.-Oct. 1993	496
—Columns during fire exposure—Test conditions and procedure (90-S7) Jan.-Feb. 1993	52
—Confined concrete using spiral reinforcement (90-S56) Sept.-Oct. 1993	542
—Fiber reinforced concrete beams under torsion (90-S50) Sept.-Oct. 1993	489
—Fiber reinforced plastic rods for prestressing tendons—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Precast flexural members—Committee report (90-S13) Jan.-Feb. 1993	115
—Reinforced concrete sections—Computer-aided analysis (90-S18) Mar.-Apr. 1993	163
—Slab-beam-column joints rehabilitated by jacketing (90-S26) May-June 1993	249
—Spliced epoxy-coated reinforcement—Effect of transverse reinforcement (90-S11) Jan.-Feb. 1993	89
Strength of concrete cured under various conditions in tropical climates —Symposium abstract, SP 139-10 (90-AB) R. Huyke-Luigi Sept.-Oct. 1993	584
Strength of epoxy-coated reinforcing bar splices confined with transverse reinforcement (90-S10) B. S. Hamad and J. O. Jirsa Jan.-Feb. 1993	77
Strengthening of reinforced concrete frame connections rehabilitated by jacketing (90-S26) Sergio M. Alcocer and James O. Jirsa May-June 1993	249
Strengthening	
—Bridge slabs—Carbon fiber reinforced plastic plates—Bonding methods—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Columns externally confined with fiber composite wraps—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Columns repaired and jacketed—Load test procedures and results (90-S60) May-June 1993	288
—Lateral confinement using fiber reinforced plastic reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Masonry walls—Flexural behavior of composite fabrics—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Strengthening of column splices for seismic retrofit of nonductile reinforced concrete frames (90-S45) Raj. Valluvan, Michael E. Kreger, and James O. Jirsa July-Aug. 1993	432
Strengthening of damaged concrete beams by external prestressing of aramid fiber cable —Symposium abstract, SP 138-53 (90-AB) N. Saeki, T. Horiguchi, M. Inomata, S. Hata, and T. Ikeda July-Aug. 1993	462
Strengthening of reinforced concrete chimneys, columns, and beams with carbon fiber reinforced plastics —Symposium abstract, SP 138-15 (90-AB) Craig Ballinger, Toshikatsu Maeda, and Tokitaro Hoshijima July-Aug. 1993	461
Stress relaxation —Prestressed concrete tank design (90-S4) Jan.-Feb. 1993	32
Stress-strain curve	
—Columns confined by circular spirals and hoops (90-S56) Sept.-Oct. 1993	542
—Steel-fiber reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
Stresses	
—Construction—Drilled pier foundations—Tie bar design (90-S24) May-June 1993	231
—Fiberglass and steel pretensioned piles—Dynamic analyzer test results (90-S67) Nov.-Dec. 1993	666
—Lightweight and normal weight concrete permeability—Symposium abstract, SP-136 (90-AB) Jan.-Feb. 1993	128
—Spliced-girder bridges—Computerized analysis (90-S3) Jan.-Feb. 1993	21
Structural analysis	
—Foundations for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
—Multistory building safety curing construction (90-S36) July-Aug. 1993	335
—Reinforced concrete sections under biaxial bending and longitudinal load (90-S18) Mar.-Apr. 1993	163
Structural design	
—Beam-column joints—Parametric investigation (90-S8) Jan.-Feb. 1993	61
—Beams—Compressive force path method (90-S2)	12
—Beams—Polymer concrete shear equation (90-S58) Sept.-Oct. 1993	562
—Column effective length—ACI simplified equations for <i>K</i> -factor (90-S25) May-June 1993	242
—Column slenderness—Proposed changes to ACI 318 provisions (90-S32) May-June 1993	302
—Columns—Short unconfined—Reliability indexes for shear and torsion limit states (90-S27) May-June 1993	262
—Columns with irregular sections under loads (90-S28) May-June 1993	269
—Deep beams and pile caps—Shear strength prediction (90-S38) July-Aug. 1993	356
—Dowel bar—Behavior against concrete core and cover (90-S46) July-Aug. 1993	441
—Ductile structural walls—Buckling considerations (90-S41) July-Aug. 1993	385
—Fiber reinforced plastic tendons and anchorages for post-tensioned concrete—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Foundations for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
—Precast concrete structures—Committee report (90-S13) Jan.-Feb. 1993	115
—Tanks—Creep compensating prestress (90-S4) Jan.-Feb. 1993	32
—Tie bars for large drilled pier foundations (90-S24) May-June 1993	231
—Viaduct structure in San Francisco—Seismic deficiencies (90-S48) Sept.-Oct. 1993	467
Structural lightweight aggregate concrete performance —Symposium abstract, SP-136 (90-AB) ACI Committee 213 Jan.-Feb. 1993	128
Strut-and-tie model for externally prestressed concrete (90-S69) K. H. Tan and A. E. Naaman Nov.-Dec. 1993	683
Strut-and-tie model for shear behavior in deep beam and pile caps failing in diagonal splitting (90-S38) Wen Bin Siao July-Aug. 1993	356
Subedi, N. K. —Reinforced concrete flanged beams—Test and analysis (90-S61) Nov.-Dec. 1993	601
Subsurface structures —Radioactive waste disposal—Mass concrete seal service life prediction—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Subsurfaces —Preparation for equipment foundations—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Suenaga, K. —Development and utilization of high-performance concrete employed in the Akashi Kaikyo Bridge—Symposium abstract, SP 140-2 (90-AB) Nov.-Dec. 1993	703
Suenaga, T. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) July-Aug. 1993	461

Sueoka, Eiji —Mechanical properties of composite beams by FRP—Symposium abstract, SP 138-9 (90-AB) July-Aug. 1993	461
Sugita, Minoru	
—Evaluation items and methods of FRP reinforcement as structural elements—Symposium abstract, SP 138-8 (90-AB) July-Aug. 1993	461
—Research and development of grid-shaped FRP reinforcement—Symposium abstract, SP 138-12 (90-AB) July-Aug. 1993	461
Suleiman, Ramadan —Behavior of jacketed columns (90-S30) May-June 1993	288
Sulfur —Polymer cement concrete—New applications—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Swaddiwudhipong, S. —Concreting of thick sections in the tropics—Symposium abstract, SP 139-9 (90-AB) Sept.-Oct. 1993	584
Swamy, R. Narayan	
—Contribution of steel fibers to the strength characteristics of lightweight concrete slab-column connections failing in punching shear (90-S37) July-Aug. 1993	342
—Influence of steel fibers on the shear resistance of lightweight concrete I-beams (90-S12) Jan.-Feb. 1993	103
—Pore structure and carbonation of lightweight concrete after 10 years' exposure—Symposium abstract, SP 136-11 (90-AB) Jan.-Feb. 1993	129
Synthetic fibers —Freeze-thaw durability of nonmetallic reinforcement—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461

T

TAC subcommittee on high-performance concrete (THPC) —High-performance concrete in severe environments—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Tadros, Maher K.	
—Computer analysis of spliced girder bridges (90-S3) Jan.-Feb. 1993	21
—Disc. closure Critical assessment of ACI 318 Eq. (18-3) for prestressing steel stress at ultimate flexure (89-S50) Sept.-Oct. 1993	577
Takagi, N. —Flexural fatigue behavior of prestressed concrete beams using aramid-fiber tendons—Symposium abstract, SP 138-31 (90-AB) July-Aug. 1993	462
Takeda, N. —Application of super workable concrete to reinforced concrete structures with difficult construction conditions—Symposium abstract, SP 140-8 (90-AB) Nov.-Dec. 1993	703
Tam, C. T. —Concreting of thick sections in the tropics—Symposium abstract, SP 139-9 (90-AB) Sept.-Oct. 1993	584
Tamura, Tomio —Absorbing capacity of cushion system using concrete slab reinforced with AFRP rods—Symposium abstract, SP 138-19 (90-AB) July-Aug. 1993	461
Tan, K. H.	
—Partially prestressed beams with carbon fiber composite strands: Preliminary tests evaluation—Symposium abstract, SP 138-27 (90-AB) July-Aug. 1993	462
—Punching shear strength of ferrocement slabs (90-S31) May-June 1993	294
—Shear behavior of steel fiber reinforced concrete beams (90-S1) Jan.-Feb. 1993	3
—Strut-and-tie model for externally prestressed concrete (90-S69) Nov.-Dec. 1993	683
—Disc. closure Partial prestressing in concrete corbels and deep beams (89-S24) Mar.-Apr. 1993	218
Tanaka, H. —Seismic design and behavior of reinforced concrete columns with interlocking spirals (90-S21) Mar.-Apr. 1993	192
Tanaka, K. —Development and utilization of high-performance concrete employed in the Akashi Kaikyo Bridge—Symposium abstract, SP 140-2 (90-AB) Nov.-Dec. 1993	703
Tanano, Hiroyuki	
—Fundamental properties of continuous fiber bars—Symposium abstract, SP 138-43 (90-AB) July-Aug. 1993	462
—Tensile strength of continuous fiber bar under high temperature—Symposium abstract, SP 138-44 (90-AB) July-Aug. 1993	462
Tanigaki, Masaharu	
—Practical application and performance of PPC beams reinforced with braided FRP bars—Symposium abstract, SP 138-51 (90-AB) July-Aug. 1993	462
—Shear performance of concrete beams reinforced with FRP stirrups—Symposium abstract, SP 138-47 (90-AB) July-Aug. 1993	462
Taniguchi, H. —Ductile behavior of beams using FRP as tendons and transverse reinforcement—Symposium abstract, SP 138-39 (90-AB) July-Aug. 1993	462
Tanks	
—Reinforced concrete—Watertightness criteria and method of testing—Committee report (90-S35) May-June 1993	324
—Stress distribution reduced by prestressing (90-S4) Jan.-Feb. 1993	32
Tankut, A. Tugrul —Behavior of jacketed columns (90-S30) May-June 1993	288
Tao, S. —Bond of GFRP rebars to ordinary-strength concrete—Symposium abstract, SP 138-21 (90-AB) July-Aug. 1993	461
Taylor, D. A. —Evaluation of FRP as reinforcement for concrete bridges—Symposium abstract, SP 138-5 (90-AB) July-Aug. 1993	461
Tazawa, Ei-ichi —Flexural and shear behavior of prestressed concrete beams using FRP rods as prestressing tendons—Symposium abstract, SP 138-32 (90-AB) July-Aug. 1993	462

Temperature —Cathodic protection for reinforced concrete structures—Symposium abstract, SP-139 (90-AB) Sept.-Oct. 1993	584
Tendon —Fiber reinforced plastic—Epoxy socketed anchors—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
Teng, Susanto —Initial and time-dependent deformation of progressively cracking nonprestressed and partially prestressed concrete beams (90-S49) Sept.-Oct. 1993	480
Tensile lap splices under static loading: A review of the proposed ACI 318 code provisions (90-S40) Tel Rezansoff, Adeniyi Akanni, and Bruce Sparling (90-S40) July-Aug. 1993	374
Tensile strength	
—Aramid fiber reinforced plastic rod—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—Column lap splices—Seismic retrofitting design and performance (90-S45) July-Aug. 1993	432
—Fiber reinforced plastic rods—Bent portion—Symposium abstract, SP-138 (90-AB) July-Aug. 1993	461
—I-beam behavior in shear (90-S61) Nov.-Dec. 1993	601
Tensile strength of continuous fiber bar under high temperature —Symposium abstract, SP 138-44 (90-AB) Susumu Kumahara, Yoshihiro Masuda, Hiroyuki Tanano, and Akiyuki Shimizu July-Aug. 1993	462
Tensile stress —Prestressed concrete highway pavement (90-S66) Nov.-Dec. 1993	658
Tension	
—Deformed bar development and splice lengths—Confinement effects (90-S42) July-Aug. 1993	393
—High-strength concrete slabs Finite element analysis (90-S52) Sept.-Oct. 1993	505
Tension tests —Anchors using different adhesive products (90-S53) Sept.-Oct. 1993	514
Teshigawara, M. —Flexural performance of concrete beams reinforced with continuous fiber bars—Symposium abstract, SP 138-45 (90-AB) July-Aug. 1993	462
Test methods	
—Chloride permeability of high-performance concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Watertightness of reinforced concrete structures—Committee report (90-S35) May-June 1993	324
Testing reinforced concrete structures for watertightness, ACI 308.1R/AWWA 400 (90-S35) ACI Committee 350/AWWA Committee 400 May-June 1993	324
Tests	
—Circular spiral reinforced column elastic shear deformations (90-S20) Mar.-Apr. 1993	180
—Fire resistance of rectangular columns (90-S7) Jan.-Feb. 1993	52
—Patch load—Offshore structure arch-shaped walls (90-S6) Jan.-Feb. 1993	42
—Reinforced concrete wall panels—Probable experimental errors (90-S64) Nov.-Dec. 1993	642
—Watertightness of structures containing water or wastewater—Committee report (90-S35) May-June 1993	324
Tests of column-flat plate connections (89-S46)	
—Scott D. B. Alexander and Sidney H. Simmonds V. 89 Sept.-Oct. 1992, p. 495	
—Disc. by Ibrahim A. E. M. Shehata and authors Sept.-Oct. 1993	574
Tests on arch-shaped ice-resisting walls for offshore structures (90-S6) Reed M. Ellis and James G. MacGregor Jan.-Feb. 1993	42
Theodorakopoulos, D. D. —Contribution of steel fibers to the strength characteristics of lightweight concrete slab-column connections failing in punching shear (90-S37) July-Aug. 1993	342
Theoretical and experimental correlation of behavior of concrete beams reinforced with fiber reinforced plastic rebars —Symposium abstract, SP 138-36 (90-AB) Salem S. Faza and Hota V. S. GangaRao July-Aug. 1993	462
Thermal stresses —Spliced-girder bridge design (90-S3) Jan.-Feb. 1993	21
Thickness —Ductile structural wall stability (90-S41) July-Aug. 1993	385
Thin polymer wearing surfaces for preventive maintenance of bridge decks —Symposium abstract, SP 137-3 (90-AB) P. D. Carter July-Aug. 1993	460
Ties	
—Blockwork masonry column behavior under axial loads (90-S51) Sept.-Oct. 1993	496
—Confinement steel design and detailing for columns with stubs (90-S44) July-Aug. 1993	414
Tightness —Tests—High-performance concrete nuclear reactor containments—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Time-dependent structural serviceability analysis of concrete structures (90-S22) Chun Qing Li Mar.-Apr. 1993	204
Tokuicu, Murat T. —Reinforced concrete columns confined by circular spirals and hoops (90-S56) Sept.-Oct. 1993	542
Tokuda, H. —Precast reinforced concrete pipe lined with polymer mortar—Symposium abstract, SP 137-1 (90-AB) July-Aug. 1993	460
Tolerances —Foundation placement for static equipment—Committee report abstract (90-S70) Nov.-Dec. 1993	692
Torque —Beams with fibrous reinforcement—Calculation formulas (90-S50) Sept.-Oct. 1993	489
Torrenti, J. M. —High-performance concretes in the "Elorn" Bridge—Symposium abstract, SP 140-4 (90-AB) Nov.-Dec. 1993	703

Torsion —Beams—Effect of steel fibers on behavior and ultimate strength (90-S50) Sept.-Oct. 1993	489
Tottori, S. —Shear capacity of RC and PC beams using FRP reinforcement—Symposium abstract, SP 138-37 (90-AB) July-Aug. 1993	462
Toughness —Carbon fiber reinforced plastic reinforced concrete beams—Symposium abstract, SP 138 (90-AB) July-Aug. 1993	461
Trumble, Russell —Advantages of using lightweight concrete in a medium-rise building and adjoining post-tensioned parking garage—Symposium abstract, SP 136-4 (90-AB) Jan.-Feb. 1993	128
Tunnels —Service—High-performance concrete used for repairing leakage problems—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703

U

Uchita, Y. —Flexural fatigue behavior of prestressed concrete beams using aramid-fiber tendons—Symposium abstract, SP 138-31 (90-AB) July-Aug. 1993	462
Ultimate strength and deformation characteristics of concrete members reinforced with AFRP rods under combined axial tension or compression and bending —Symposium abstract, SP 138-40 (90-AB) Naotaka Kawaguchi July-Aug. 1993	462
Ultimate strength of confined very high-strength concretes (90-S63) S. Setunge, M. M. Attard, and P. LeP. Darvall (90-S63) Nov.-Dec. 1993	632
Underwater adhesion of polymethyl methacrylate mortars —Symposium abstract, SP 137-6 (90-AB) Y. Ohama, K. Demura, S. N. Pareek, and M. A. R. Bhutta July-Aug. 1993	460
Underwater construction	
—High-performance concrete used for repair and rehabilitation—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Polymethyl methacrylate mortars—Adhesion and strength tests—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Uomoto, T.	
—Design concept for concrete members using continuous fiber reinforced materials—Symposium abstract, SP 138-33 (90-AB) July-Aug. 1993	462
—Properties of fiber reinforced plastic rods for prestressing tendons—Symposium abstract, SP 138-7 (90-AB) July-Aug. 1993	461
Use of a high-performance air-entrained concrete for the construction of the Portneuf Bridge, The —Symposium abstract, SP 140-3 (90-AB) P. C. Altin, G. Ballivy, D. Mitchell, M. Pigeon, and L. G. Coulombe Nov.-Dec. 1993	703
Use of epoxy compounds with concrete, ACI 503R—Revision (90-CA) ACI Committee 503 Sept.-Oct. 1993	584

V

Valluvan, Raj. —Strengthening of column splices for seismic retrofit of non-ductile reinforced concrete frames (90-S45) July-Aug. 1993	432
Vaults —Steel fiber reinforced polymer concrete applications—Symposium abstract, SP-137 (90-AB) July-Aug. 1993	460
Vaysburd, Alexander M. —Durability of lightweight concrete and its connections with the composition of concrete, design, and construction methods—Symposium abstract, SP 136-7 (90-AB) Jan.-Feb. 1993	128
Very early post-tensioning of prestressed concrete pavements (90-S66) J. Scott O'Brien, Ned H. Burns, and B. Frank McCullough Nov.-Dec. 1993	658
Viaducts	
—Double-deck—Proof test of a retrofit concept (90-S62) Nov.-Dec. 1993	616
—Seismic deficiencies—Retrofit design for double deckers (90-S48) Sept.-Oct. 1993	467
von Fay, K. F. —Development of very low heat mass concrete mixtures for the modification of Theodore Roosevelt Dam—Symposium abstract, SP 140-13 (90-AB) Nov.-Dec. 1993	704
Vonk, René A. —Splitting forces in FRP pretensioned concrete—Symposium abstract, SP 138-1 (90-AB) July-Aug. 1993	461

W

Wadsack, Patricia —Driving stresses in fiberglass pretensioned piles (90-S67) Nov.-Dec. 1993	666
Wafa, Faisal F. —Flexural behavior of high-strength fiber reinforced concrete beams (90-S29) May-June 1993	279
Wainwright, P. J. —Properties of pozzolanic mortars cured in hot dry environments—Symposium abstract, SP 139-5 (90-AB) Sept.-Oct. 1993	584
Wakeley, L. D. —Salt saturated mass concrete under chemical attack—Symposium abstract, SP 140-12 (90-AB) Nov.-Dec. 1993	703
Wakui, H. —Shear capacity of RC and PC beams using FRP reinforcement—Symposium abstract, SP 138-37 (90-AB) July-Aug. 1993	462
Walls	
—Ice-resisting—V-shaped arches—High-magnitude patch load tests (90-S6) Jan.-Feb. 1993	42
—Precast concrete design recommendations—Committee report (90-S13) Jan.-Feb. 1993	115

—Reinforced concrete test panels—Shear deformation calculation errors (90-S64) Nov.-Dec. 1993	642
—Reinforced or masonry buildings—Out-of-plane buckling prediction (90-S41) July-Aug. 1993	385
—Structural—Deformable soil—Rigidity evaluation (90-S17) Mar.-Apr. 1993	156
—Thin and tall—Mix proportioning super-workable concrete—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
Watanabe, H.	
—RC slabs strengthened by bonded carbon FRP plates: Part 1—Laboratory study—Symposium abstract, SP 138-54 (90-AB) July-Aug. 1993	462
—RC slabs strengthened by bonded carbon FRP plates: Part 2—Application—Symposium abstract, SP 138-55 (90-AB) July-Aug. 1993	462
Watanabe, S. —Application of three-dimensional fabric reinforced concrete to building panels—Symposium abstract, SP 138-14 (90-AB) July-Aug. 1993	461
Watanabe, S. —Development and utilization of high-performance concrete employed in the Akashi Kaikyo Bridge—Symposium abstract, SP 140-2 (90-AB) Nov.-Dec. 1993	703
Water—Pressure—Material behavior of concrete (90-S33) May-June 1993	310
Watertightness —Criteria and test methods for reinforced concrete structures—Committee report (90-S35) May-June 1993	324
Weber, H. H., Jr. —New applications and expanding markets for sulfur polymer cement concrete—Symposium abstract, SP 137-4 (90-AB) July-Aug. 1993	460
Webs —Crushing mode in I-shaped flanged beam (90-S61) Nov.-Dec. 1993	601
Wight, James K. —Cyclic response of fibrous cast-in-place connections in precast beam-column subassemblages (90-S34) May-June 1993	316
Windisch, Andor	
—Disc. Beam analysis using concrete tensile strength in truss models (89-S27) Mar.-Apr. 1993	220
—Disc. Joints between reinforced concrete members of similar depth (89-S28) Mar.-Apr. 1993	220
—Disc. Partial prestressing in concrete corbels and deep beams (89-S24) Mar.-Apr. 1993	218
Wong, Yuk-Lung —Response of circular reinforced concrete columns to multi-directional seismic attack (90-S20) Mar.-Apr. 1993	180
Workability	
—Flowable concrete mix proportioning and properties—Japan research—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703
—Super-workable concrete properties and durability—Applications to projects in Japan—Symposium abstract, SP-140 (90-AB) Nov.-Dec. 1993	703

XYZ

Xi, Zuhan —Pultruded FRP grating reinforced concrete slabs—Symposium abstract, SP 138-34 (90-AB) July-Aug. 1993	462
Yamada, Kanji —Flexural behavior of cementitious composites reinforced by pitch-based high modulus continuous carbon fibers—Symposium abstract, SP 138-17 (90-AB) July-Aug. 1993	461
Yamada, Masao —Mechanical properties of composite beams by FRP—Symposium abstract, SP 138-9 (90-AB) July-Aug. 1993	461
Yamada, Takashi —Flexural behavior of cementitious composites reinforced by pitch-based high modulus continuous carbon fibers—Symposium abstract, SP 138-17 (90-AB) July-Aug. 1993	461
Yamasaki, Yuichi —Fundamental properties of continuous fiber bars—Symposium abstract, SP 138-43 (90-AB) July-Aug. 1993	462
Yankelevsky, David Z. —Cyclic behavior of epoxy-repaired reinforced concrete beam-column joints (90-S19) Mar.-Apr. 1993	170
Yasuoka, Keiichi —Mechanical properties of composite beams by FRP—Symposium abstract, SP 138-9 (90-AB) July-Aug. 1993	461
Yau, C. Y. —Biaxial bending design of arbitrarily shaped reinforced concrete column (90-S28) May-June 1993	269
Yonekura, Asuo —Flexural and shear behavior of prestressed concrete beams using FRP rods as prestressing tendons—Symposium abstract, SP 138-32 (90-AB) July-Aug. 1993	462
Yonemaru, Katsuke —Bond performance of concrete members reinforced with FRP bars—Symposium abstract, SP 138-46 (90-AB) July-Aug. 1993	462
Yonezawa, Toshio —Flexural behavior and energy absorption of carbon FRP reinforced concrete beams—Symposium abstract, SP 138-35 (90-AB) July-Aug. 1993	462
Zak, M. L. —Computer analysis of reinforced concrete sections under biaxial bending and longitudinal load (90-S18) Mar.-Apr. 1993	163
Zapico, J. L. —Disc. Finite element modeling of corrosion damage in concrete structures (89-S67) Sept.-Oct. 1993	579
Zavadsky, E. —Designing a better polymer concrete based on unsaturated polymer—Symposium abstract, SP 137-7 (90-AB) July-Aug. 1993	460
Zhou, Ren-Gen —On effective length factor of framed columns in the ACI Building Code (90-S14) Mar.-Apr. 1993	135
Zhou, Zongyu —Bearing strength of compressive struts confined by plain concrete (90-S55) Sept.-Oct. 1993	534
Zia, P. —Chloride permeability and AC impedance of high-performance concrete—Symposium abstract, SP 140-6 (90-AB) Nov.-Dec. 1993	703

